Vol. 939 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 7, 1975

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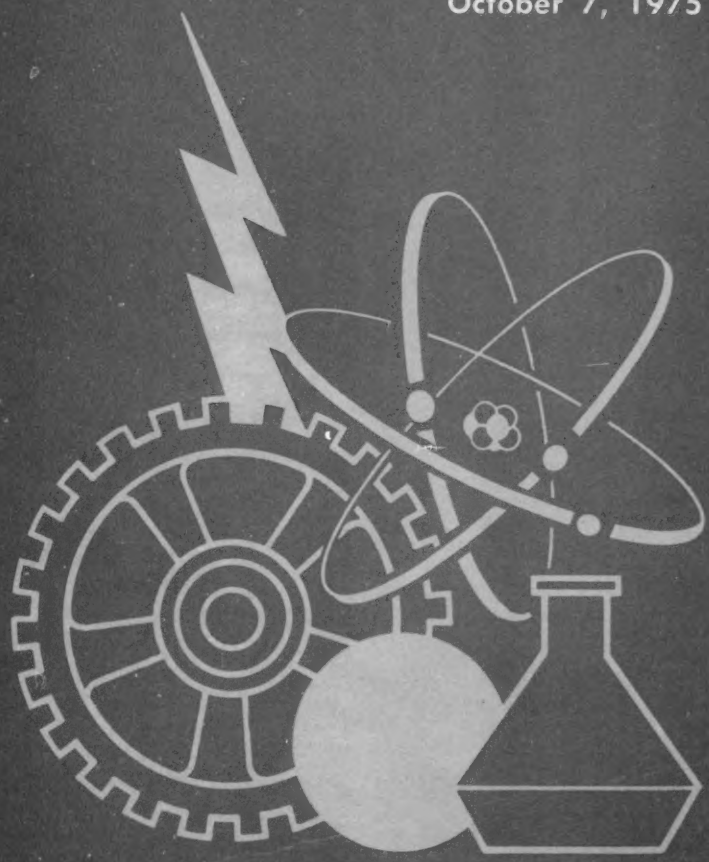

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

October 7, 1975 Volume 939 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Results of Trial Voluntary Protest Program

This notice summarizes the results of the first Trial Voluntary Protest Program. This program was announced in the Commissioner's Notice of May 7, 1974, which appeared in the OFFICIAL GAZETTE on June 4, 1974 at 923 O.G. 2.

Under the Program, a limited number of applicants were given an opportunity to waive confidentiality of their allowed applications in order to allow publication and public inspection thereof prior to issuance of a patent.

A request for a waiver of confidentiality was mailed in 2,000 applications. Two were returned undelivered by the Postal Service. Signed waivers of confidentiality were received for 667 applications within the two-month period for response to the request letter. At least one claim, and a drawing figure, if any, from each of the 667 applications was published in the OFFICIAL GAZETTE of January 28, 1975. That issue of the OFFICIAL GAZETTE also included a notice, at 930 O.G. 1454, which gave additional information relating to inspection of the published applications and the filing of protests.

The period for submitting protests was three months in length, ending on April 28, 1975. During this period 67 protests were filed in sixty applications.

The evidence against allowability of claims submitted in the sixty applications was considered by the appropriate examiners and group directors. The group directors determined that claims should be rejected and prosecution should be reopened in 37 applications. No prima facie showing of non-patentability was deemed made in the protests to 23 applications, and consequently, the prosecution was not reopened in these applications.

These statistics are shown, by examining group, in Table I.

TABLE I.—APPLICATIONS IN PROGRAM

	Number of waivers requested	Number of waivers received	Total number protested	Number reopened	Number not reopened
Examining group:					
110	135	65	11	9	2
120	135	68	6	6	0
140	134	54	9	3	6
160	135	54	4	3	1
170	135	44	4	0	4
210	135	44	2	0	2
220	109	39	3	2	1
230	135	52	2	1	1
240	136	32	4	1	3
250	135	49	4	4	0
310	135	35	1	1	0
320	135	38	4	2	2
330	135	22	0	0	0
340	134	39	3	2	1
350	135	32	3	3	0
Totals	1,998	667	60	37	23

The following data were tabulated about the 667 published patent applications:

1. 9 percent of the applications published were protested.
2. 120 requests for access to the published applications were made during the protest period.
3. Approximately 100 requests for copies of the file wrapper contents of the published applications were made during the protest period.
4. 7 percent of the published applications were divisional applications.
5. 8 percent of the published applications were continuation-in-part applications.
6. 5 percent of the published applications were continuations.

The following data show the origin and ownership of the published applications as compared to the patents issued in 1974.

	Percent	
	Published applications	Patents issued in 1974
1. Assigned to corporations	71	74
2. No assignment indicated	24	24
3. Assigned to U.S. Government	5	2
4. Foreign origin	31	34

Statistics concerning the ownership, origin and type of application are shown by examining group in Table II.

TABLE II.—PUBLISHED APPLICATION DATA

	Number published	Application ownership			Foreign origin	Type of application			
		Assigned	Govt.	Unassigned		Cont.	Cont.-in-part	Division	Substitute
Examining group:									
110	65	53	2	10	15	2	9	3	0
120	68	47	1	20	32	5	9	13	0
140	54	38	2	14	12	3	6	6	0
160	54	38	1	15	18	2	6	9	0
170	44	28	1	15	5	3	5	2	0
210	44	34	1	9	16	3	1	2	0
220	39	16	16	7	13	3	2	2	1
230	52	43	0	9	19	1	4	1	0
240	32	21	2	9	11	0	0	1	0
250	49	35	2	12	24	8	1	2	0
310	35	26	1	8	13	0	0	1	0
320	38	30	0	8	12	0	3	2	0
330	22	16	0	6	6	1	2	0	0
340	39	27	0	12	7	0	5	0	0
350	32	22	1	9	5	2	2	2	0
Corps	667	474	30	163	208	33	55	46	1

Protests Filed

As indicated above, 67 protests were received in the sixty protested applications. Seven applications attracted two protests each. No application received more than two protests. The 37 applications in which prosecution has been reopened constitute 62 percent of the applications in which protests were received.

The following data in Table III were tabulated from questionnaires completed by the examiner in each protested application.

TABLE III.—PROTESTER INFORMATION

	Reopened		Not reopened		Total	
Protester	Number of protests	Percent	Number of protests	Percent	Number of protests	Percent
Anonymous	7	15.9	9	39.1	16	23.9
Identified	37	84.1	14	60.9	51	76.1
Total	44	100	23	100	67	100
Percent of total	65.7		34.3		100	

The protests in 90% of both the reopened and not reopened applications appeared to originate from corporations.

Protest Content

The issues or grounds for non-patentability raised in the 67 protests filed are tabulated in Table IV. The number shown indicates the number of protests which involved the indicated

issue. It will be noted that some protests involved more than one issue.

TABLE IV.—ISSUES INVOLVED IN PROTESTS

Issue involved	Number of protests: In applications—Reopened	Not reopened	Total
1. Prior art under 35 USC 102	23	4	27
2. Prior art under 35 USC 103	34	20	54
3. Prior public use or sale under 35 USC 102 (b)	1	0	1
4. Prior invention under 35 USC 102(g)	3	0	3
5. 35 USC 112, first paragraph	7	1	8
6. 35 USC, second paragraph	5	1	6
7. Misrepresentation or fraud	1	1	2

Most of the protests filed included the citation of at least one prior art reference. A few protests were based upon prior art already of record in the applications. Others were based upon newly cited references, and some were based upon a combination of prior art already of record with newly cited references. The number of protesters relying upon prior art of record and newly cited prior art and the type of references relied upon is shown in Table V.

TABLE V.—PRIOR ART CITED IN PROTESTS

Type of prior art	Number of protests: In applications—Reopened	Not reopened	Total
Prior art of record	12	12	24
Prior art newly cited	30	23	62
U.S. patents	31	18	49
Foreign patents	17	6	23
Non-patent literature	20	8	28

The number of prior art citations, by type, submitted by the 44 protesters in the 37 applications which were reopened for prosecution is shown in Table VI.

TABLE VI.—PRIOR ART CITATIONS MADE IN APPLICATIONS REOPENED FOR PROSECUTION

Type of prior art	Number of protests	×	Number of citations	=	Total
U.S. patents	11		1		11
	10		2		20
	6		3		18
	1		4		4
	1		7		7
	1		11		11
	1		12		12
	31		Cited		83
Foreign patents	15		1		15
	1		2		2
	1		3		3
	17		Cited		20
Non-patent literature	10		1		10
	6		2		12
	4		3		12
	20		Cited		34

The number of prior art citations, by type, submitted by the 23 protesters in the 23 applications which were not reopened for prosecution is shown in Table VII.

TABLE VII.—PRIOR ART CITATIONS MADE IN APPLICATIONS NOT REOPENED FOR PROSECUTION

Type of prior art	Number of protests	×	Number of citations	=	Total
U.S. patents	9		1		9
	5		2		10
	1		3		3
	2		4		8
	1		6		6
	18		Cited		36
Foreign patents	5		1		5
	1		2		2
	6		Cited		7
Non-patent literature	4		1		4
	3		2		6
	1		3		3
	8		Cited		13

Protested Applications

The type of applications in which protests were filed is shown in Table VIII.

TABLE VIII.—TYPE OF APPLICATIONS IN WHICH PROTESTS WERE FILED

Type	Reopened: Number protested	Percent	Not reopened: Number protested	Percent	Total: Number protested	Percent
Original	33	89.2	19	82.6	52	86.7
Continuation	1	2.7	1	4.3	2	3.3
Continuation-in-part	2	5.4	2	8.7	4	6.7
Divisional	1	2.7	1	4.3	2	3.3

Summary

Only a few letters from the public were received which commented on the Trial Voluntary Protest Program. Most of these related to the problems of obtaining copies of the January 28, 1975 OFFICIAL GAZETTE.

Of the 667 published applications, two have been expressly abandoned by the applicant. Prosecution of one application has been reopened by the examiner on newly discovered prior art even though no protest was filed. Also, two applications are being held in the examining groups pending possible interferences. Otherwise, all non-protested and non-reopened applications have been forwarded to the Patent Issue Division for processing.

A Second Trial Voluntary Protest Program will commence in the next few weeks. The program announcement appears in the September 16, 1975 OFFICIAL GAZETTE.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Dated: Sept. 4, 1975.

Notice to Official Gazette Subscribers

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the patent and/or trademark sections of the OFFICIAL GAZETTE.

The Superintendent of Documents advises that expiration notices are sent out approximately three months in advance of the expiration date. However, subscribers should not be dependent upon such notices. In the event that a notice is not received within two months of the expiration date, the subscriber should renew his subscription with the Superintendent of Documents and *attach a label* from the envelope in which he receives the gazette, together with a check covering the amount of the subscription.

In case of complete stoppage, please send a copy of your order or expiration notice, together with proof of payment (copy of cancelled check or processed order), to Mr. S. J. Bania, Director, Office of Publications (Room 2–5C26), Patent and Trademark Office, Washington, D.C. 20231, Attention: Shirley A. Hammel (Telephone 703/557–3794), or Lillie M. Harrison (Telephone 703/557–1985).

This notice is effective with the publication date and supersedes the notice published on this subject in O.G. 934, dated May 20, 1975.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

Sept. 12, 1975.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,837,834, Alexeff, Homburg and Richards, WEB HEAT TREATMENT AND APPARATUS THEREFOR, **filed** June 6, 1975, D.C., N.D. Ohio (Cleveland), Doc. C75–481, *Industrial Ovens, Inc. v. Alexeff-Snyder Enterprises, Inc. et al.*

2,844,127, C. Steiner, FLUID PRESSURE TORQUE CONVERTER; **2,844,128**, same, **filed** Apr. 17, 1975, U.S. Court of Claims (District of Columbia), Doc. 123–75, *Flo-Tork, Inc. v. The United States of America.*

2,933,223, Kravig and Johnson, DECORATIVE BOWS AND METHOD AND MACHINE FOR FABRICATING THE SAME; **3,112,240**, same, DECORATIVE BOWS, **filed** June 11,

1975, D.C., E.D. Pa. (Philadelphia), Doc. 75–1663, *Minnesota Mining and Manufacturing Company* v. *Delaware Ribbon Manufacturers, Inc. and Synthetic Fibers.* **Same, filed** June 11, 1975, D.C., W.D. Pa. (Pittsburgh), Doc. 75–701 C.A., *Minnesota Mining and Manufacturing Company* v. *Papercraft Corp. and CPS Industries, Inc.*

2,972,728, F. H. Cole, ELECTRICAL PLUG HAVING SELF-ALIGNING TERMINAL PINS; **2,999,998,** same, SELF-ALIGNING ELECTRICAL CONNECTOR ASSEMBLY; **3,056,940,** B. J. Winestock, SELF-ALIGNING COAXIAL CONNECTOR; **3,064,226,** F. H. Cole, VIBRATION RESISTANT CONNECTOR; **3,083,274,** H. P. Sparkes, CONNECTOR ASSEMBLY; **3,434,-096,** A. J. Pusateri, COUPLING; **3,518,615,** Sparkes, Bowman and Pusateri, ELECTRICAL CONNECTOR ASSEMBLY; **3,518,617,** Bosworth, Bowman, Sparkes and Young, ELECTRICAL CONNECTORS, **filed** May 1, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV 75–1494–ALS, *Viking Industries, Inc.* v. *Lockheed Aircraft Corp.*

2,999,998. (See 2,972,728.)

3,004,772, Bohlen, Shephard and D'Orazio, TANDEM AXLE SEMI-TRAILER CONVERTIBLE TO SINGLE AXLE SEMI-TRAILERS AND VICE VERSA; **3,317,219,** Hindin, Levitt and Abolins, VEHICLE FORMED BY COUPLEABLE CONTAINERS WITH DEMOUNTABLE ADAPTER FRAMES, **filed** Mar. 7, 1975, U.S. Court of Claims (District of Columbia), Doc. 467–72, *Strick Corporation* v. *The United States.* Order, judgment is entered in favor of the plaintiff, Mar. 14, 1975.

3,005,456, G. C. Graham, Jr., CATAMENIAL DEVICE; **3,241,553,** F. H. Steiger, SURGICAL DRESSING, **filed** May 19, 1975, D.C., S.D. Ohio (Cincinnati), Doc. C–1–75–181, *Personal Products Co., Inc.* v. *Procter & Gamble Co., Charmin Paper Products Co. and Buckeye Cellulose Corp.*

3,026,900, R. H. Hieger, CARBURETOR FLOAT CLIP, **filed** June 3, 1975, U.S. Court of Appeals, Sixth Circuit, Ohio (Cincinnati), Doc. 74–2070–71, *Robert H. Hieger and Robert H. Elliott* v. *Ford Motor Company.* Finding of District Court of non-infringement affirmed. Adjudgment of validity vacated. Effect of opinion is to leave question of validity unadjudicated, June 3, 1975.

3,056,836, H. D. Moed, ARALKYLAMINES AND METHODS OF PREPARATION THEREOF, **filed** June 6, 1975, D.C., N.D. Ill. (Chicago), 75c1846, *Mead Johnson & Company and U.S. Philips Corporation* v. *Generic Pharmacal, doing business as Ample Pharmacal Co. et al.*

3,056,940. (See 2,972,728.)

3,064,226. (See 2,972,728.)

3,083,274. (See 2,972,728.)

3,112,240. (See 2,933,223.)

3,186,491, L. J. Fischer, HELICOPTER DRIVE SYSTEM UTILIZING TIP MOUNTED FANS; **Re. 26,518,** Mau and Nagy, THREAD AND OTHER FORM ROLLING DIES, **filed** Sept. 12, 1972, D.C., N.D. Ohio (Cleveland), Doc. C–72–959, *The National Rolled Thread Die Company* v. *E. W. Ferry Screw Products, Inc.* Judgment on decision by the Court, finding that patent in suit valid, but not infringed. Judgment entered in favor of defendant as to the claim of infringement; further ordered that Court's memorandum opinion is adopted as findings of fact and conclusions of law, filed Apr. 30, 1975.

3,203,259, H. H. P. Lemmerman, VISCOUS DAMPED SENSING DEVICE, **filed** June 6, 1975, U.S. Court of Claims (District of Columbia), Doc. 188–75, *General Electric Co.* v. *The United States of America.*

3,241,553. (See 3,005,456.)

3,254,510, B. G. Lesley, WARP KNIT PILE FABRICS; **3,277,673,** same, METHOD FOR PREPARING KNIT FABRICS; **3,552,154,** B. G. Lesley, KNIT FABRICS, **filed** Mar. 26, 1975, D.C., S.D.N.Y., Doc. 75–C–1519, *Charbert Inc. and Charbert Fabrics Corp.* v. *Deering Milliken Corp. and Deering Milliken Research Corp.* **Same, filed** Mar. 26, 1975, D.C., S.D.N.Y., Doc. 75–C–1518, *Liberty Fabrics of New York, Inc. and Gordonsville Industries, Inc.* v. *Deering Milliken, Inc. and Deering Milliken Research Corporation.*

3,266,358, Cox and Wich, KEY PUNCHING MACHINE, **filed** June 12, 1975, D.C., N.D. Tex. (Dallas), Doc. CA 3–75–0724–B, *Horst W. Wich and Clifford B. Box* v. *Rueben Boarman and Boarman, Inc.*

3,277,673. (See 3,254,510.)

3,303,938, A. Solomon, GARMENT RACK, **filed** June 13, 1975, D.C., E.D. Pa. (Philadelphia), Doc. 75–1694, *Archie Solomon* v. *W & G Specialties Company.*

3,317,219. (See 3,004,772.)

3,408,470, J. R. Gier, Jr., INDUCTION FURNACE EMPLOYING HIGH PURITY ATMOSPHERE, **filed** June 12, 1975, D.C., N.D. Ohio (Cleveland), Doc. C75–501, *John R. Gier and Gier Development Corp.* v. *Ferrotherm Co. and Valley Metallurgical Processing Co. Inc.*

3,434,096. (See 2,972,728.)

3,499,239, A. J. Mungo, FIREPLACE FLAME SIMULATING DEVICE; **3,526,984,** Nielsen and Valliant, LIGHTED FIREPLACE AND FIRE NOISE SIMULATOR, **filed** Dec. 6, 1973, D.C.N.J. (Newark), Doc. C–1754–73, *Drum Fire, Inc.* v. *Rustic Crafts Co., Inc.* Order of dismissal of action, Apr. 14, 1975.

3,518,615. (See 2,972,728.)

3,518,617. (See 2,972,728.)

3,526,984. (See 3,499,239.)

3,546,355, F. B. Maynard, AUTOMATIC GENERATING SYSTEM FOR AN ELECTRONIC ORGAN; **3,548,065,** A. B. Freeman, AUTOMATIC RHYTHM SYSTEM WITH SELECTABLE PLURAL MUSICAL ARRANGEMENTS, **filed** May 22, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1644, *Alfred B. Freeman* v. *Motorola, Inc.*

3,547,811, J. R. McWhirter, CYCLIC OXYGENATION OF BOD-CONTAINING WATER; **3,547,812,** same, HIGH OXYGEN UTILIZATION IN BOD-CONTAINING WATER TREATMENT; **3, 547,813,** BIOCHEMICAL OXIDATION WITH LOW SLUDGE RECYCLE; **3,547,815,** J. R. McWhirter, STAGED OXYGENATION OF BOD-CONTAINING WATER, **filed** May 2, 1975, D.C., S.D.N.Y., Doc. 2098, *Air Products and Chemicals, Inc.* v. *Union Carbide Corporation.*

3,547,812. (See 3,547,811.)

3,547,813. (See 3,547,811.)

3,547,815. (See 3,547,811.)

3,548,065. (See 3,546,355.)

3,552,154. (See 3,254,510.)

3,552,154, B. G. Lesley, KNIT FABRIC, **filed** May 5, 1975, D.C., E.D. Va. (Alexandria), Doc. 344–75–A, *Deering Milliken Research Corporation* v. *Gordonsville Industries, Inc.*

3,658,327, C. S. Thiede, PULL-TYPE EXERCISING DEVICE; **Reg. No. 971,804** (DYNA-GYM), Marcy Gymnasium Equipment Co., **filed** Apr. 25, 1975, D.C., S.D. Calif. (San Diego), Doc. 75–0227OT, *Marcy Gymnasium Equipment Co. and Clifford S. Thiede* v. *Total Gym, Inc.*

3,725,158, Messerschmidt, Jr., Heyman and Johnsen II, MULTI COMPONENT POWDERLESS ETCHING BATH ADDITIVE; **3,725,159,** same, POWDERLESS ETCHING BATH COMPOSITIONS; **3,728,180,** same; **3,730,899,** same, POWDERLESS ETCHING BATH ADDITIVE; **3,736,197,** same, POWDERLESS ETCHING BATH COMPOSITIONS AND ADDITIVES, **filed** Nov. 9, 1973, D.C., N.D. Ga. (Atlanta), Doc. 19325, *Mona Industries, Inc.* v. *Cox Enterprises, Inc., doing business as Atlanta Newspapers.* Stipulation of dismissal with clerk's entry of dismissal pursuant to Rule 41(a)(1)(ii), Federal Rules of Civil Procedure, Mar. 28, 1975.

3,725,159. (See 3,725,158.)

3,728,180. (See 3,725,158.)

3,730,899. (See 3,725,158.)

3,736,197. (See 3,725,158.)

3,853,168, W. A. Wrono, ROLL-UP SHADE CONSTRUCTION AND MEHTOD OF ERECTING SAME, **filed** Mar. 4, 1975, D.C., S.D. Fla. (Fort Lauderdale), Doc. (FL) 75–98–C–PF, *Wrono Enterprise Corp.* v. *A.B.C. Foldaway Shutter Corp. et al.*

Re. 26,518. (See 3,186,491.)

Reg. No. 971,804. (See 3,658,327.)

Errata

All reference to Patent No. 3,899,345 to L. J. Minnick et al. of Pennsylvania for Lime-Fly Ash-Sulfite Compositions appearing in the OFFICIAL GAZETTE of August 12, 1975 should be deleted since no patent was granted.

All reference to Patent No. 3,907,035 to Duane L. Stude et al. of Oklahoma for Cement Composition and Method of Cementing appearing in the OFFICIAL GAZETTE of September 23, 1975 should be deleted since no patent was granted.

Certificates of Correction for the Week of Oct. 7, 1975

P.P. 3,693	3,856,875	3,878,661	3,889,501
Re. 28,197	3,857,682	3,879,188	3,889,593
D. 234,738	3,859,117	3,879,295	3,890,195
D. 234,961	3,859,362	3,879,626	3,890,282
D. 236,199	3,859,418	3,879,657	3,890,625
3,499,398	3,859,602	3,880,800	3,891,023
3,673,191	3,859,784	3,881,484	3,891,589
3,736,385	3,860,441	3,881,541	3,891,653
3,751,796	3,862,387	3,881,582	3,891,733
3,753,769	3,862,414	3,881,696	3,891,830
3,770,747	3,862,741	3,881,784	3,891,943
3,772,846	3,862,906	3,882,083	3,892,449
3,796,678	3,863,063	3,882,088	3,892,710
3,796,835	3,863,325	3,882,175	3,892,762
3,797,195	3,864,185	3,882,857	3,892,816
3,801,531	3,864,644	3,882,872	3,892,856
3,805,863	3,865,798	3,882,935	3,893,173
3,808,180	3,866,737	3,883,096	3,893,287
3,810,751	3,867,190	3,883,247	3,893,345
3,813,375	3,867,281	3,883,273	3,893,405
3,814,235	3,867,335	3,883,606	3,893,763
3,816,919	3,869,462	3,883,782	3,893,766
3,820,113	3,869,490	3,883,808	3,893,849
3,823,183	3,870,664	3,884,396	3,894,093
3,823,271	3,871,979	3,884,671	3,894,165
3,826,113	3,872,039	3,884,780	3,894,372
3,826,805	3,872,254	3,885,004	3,894,658
3,830,863	3,872,262	3,885,660	3,894,727
3,830,885	3,872,835	3,885,849	3,894,849
3,835,884	3,873,041	3,885,902	3,895,015
3,836,395	3,873,456	3,885,929	3,895,053
3,836,614	3,873,619	3,886,069	3,895,125
3,838,688	3,874,157	3,886,298	3,895,131
3,841,827	3,874,566	3,886,819	3,895,156
3,842,626	3,874,770	3,886,821	3,895,221
3,845,101	3,875,508	3,887,037	3,895,303
3,845,476	3,875,530	3,887,280	3,895,569
3,846,477	3,875,886	3,887,298	3,895,574
3,849,496	3,876,115	3,887,417	3,895,962
3,850,726	3,876,167	3,887,437	3,896,356
3,851,019	3,876,474	3,887,513	3,896,576
3,851,086	3,876,652	3,887,728	3,897,420
3,851,137	3,876,690	3,887,928	3,897,537
3,853,167	3,876,714	3,888,065	3,897,906
3,853,426	3,877,608	3,888,179	3,898,236
3,853,947	3,877,705	3,888,396	3,898,544
3,855,183	3,877,935	3,888,911	3,898,679
3,855,806	3,878,047	3,888,962	3,899,291
3,856,272	3,878,137	3,888,998	3,899,715
3,856,801	3,878,361	3,889,043	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 13, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-28-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; O⁻o and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-1-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-20-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	11-19-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-7-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-4-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-4-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	2-19-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-3-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-11-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-6-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-3-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-8-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	11-27-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	3-14-75

Expiration of patents: The patents within the range of numbers indicated below expire during October 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,854,669 to 2,858,536 inclusive
Plant Patents..... Numbers 1,758 to 1,767 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED OCTOBER 7, 1975

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

Actual Filing Date of Oldest New Case Awaiting Action

1-28-75

11-1-74

12-20-74

11-19-74

1-7-75

12-4-74

10-4-74

12-2-74

2-19-75

12-3-74

6-11-74

1-6-75

1-3-75

1-8-75

11-27-74

3-14-75

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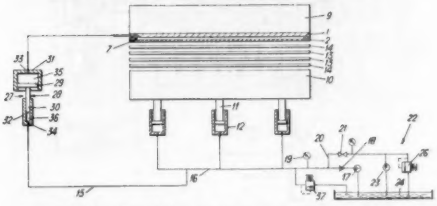
inclusive inclusive

T939,001
PRESSING

Kenneth Clarke, Knebworth, and Thomas Alfred Stanley, Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 30, 1972, Ser. No. 301,727
Claims priority, application Great Britain, Nov. 5, 1971, 51,487/71
Int. Cl. B30b *15/34*; B02c *11/08*
U.S. Cl. 100—38
4 Sheets Drawing. 42 Pages Specification



A method of making a pressed article including the step of pressing a workpiece and at least one resilient liquid-filled cushion plate between the platens of a press and heating, or optionally cooling, the workpiece and cushion plate during the pressing operation is disclosed. The pressing operation is accomplished such that the volume of liquid in the chamber of the cushion plate is maintained substantially constant by providing means responsive to the pressure within the cushion plate to accept the increase in volume of liquid brought about by the thermal expansion of the liquid filling the chamber in the heated embodiment, or to introduce additional liquid into the closed chamber when the pressing is conducted and the workpiece is cooled.

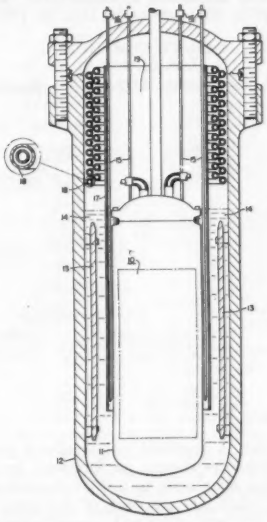
The disclosed resilient cushion plate includes a pair of continuous metal sheets spaced apart from each other in a substantially parallel manner, at least one of the sheets being relatively thin and flexible. The sheets are sealed together around their peripheries to define an inner chamber which can be completely filled with a liquid and the plate is provided with an entrance leading into the chamber positioned so as to not interfere with the pressing operation. The entry port permits the filling of the chamber with liquid and provides for communication to and from the chamber for accommodating the expansion or contraction of liquid within the chamber, depending upon pressing conditions. The invention is particularly adapted for pressing sheets of plastics materials and an apparatus for conducting the method is also described.

T939,002
EPITHERMAL NUCLEAR REACTOR

John F. Patterson, Richland, Wash., and Wilfred H. Comtois, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 18, 1973, Ser. No. 352,372
Int. Cl. G21c *15/02*
U.S. Cl. 176—61
4 Sheets Drawing. 17 Pages Specification

A supercritical nuclear reactor is disclosed having a core which includes fuel elements containing a mixture of beryllium oxide and enriched uranium. The combination of beryllium oxide in the fuel and the reactor coolant, comprising light water, provides nuclear moderation such that the reactor operates within the epithermal energy spectrum. The reactor coolant achieves operating conditions by making three or more passes through the nuclear core. Reactor control is accomplished by boron carbide control rods located within the nuclear core.

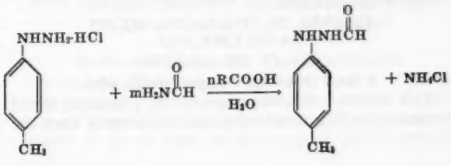


T939,003
METHOD FOR SYNTHESIS OF 1-FORMYL-2-(P-TOLYL) HYDRAZINE

Cataldo A. Maggiulli and Richard J. Schottmiller, both of 1669 Lake Ave., Rochester, N.Y. 14650

Filed Aug. 13, 1973, Ser. No. 387,824
Int. Cl. C07c *103/30*
U.S. Cl. 260—562 H
No Drawing. 10 Pages Specification

1-Formyl-2-(p-tolyl)hydrazine has been synthesized directly from p-tolylhydrazine hydrochloride and formamide by a single, one-step method which comprises reacting the p-tolylhydrazine hydrochloride at an elevated temperature in the range of about 40° C. to 70° C. with formamide in the presence of water and a lower alkanoic acid. The synthesis may be represented by the following formula:



wherein R is a hydrogen atom or an alkyl having 1 to 5 carbon atoms, *m* is a number greater than 1, preferably about 2, and *n* is a number from about 6 to about 8. The method of this invention is more advantageous than prior art methods in that it is readily adaptable to large scale production, provides increased yields, and has only one step thereby eliminating the need to isolate p-tolylhydrazine, a relatively unstable intermediate. Moreover, crude p-tolylhydrazine hydrochloride may be used in the reactions thereby eliminating a purification step.

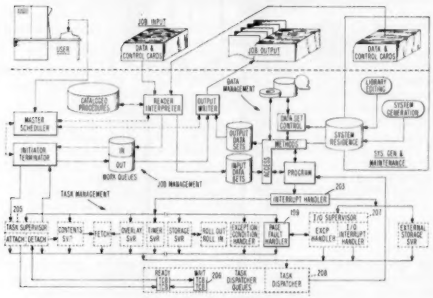
T939,004

ALGORITHM FOR PAGE RECLAMATION VIA CHANGE BIT RECORDING IN RELOCATABLE CPU ENVIRONMENTS

Warren J. Kelley, Berkshire, and Lawrence E. Larson, Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of abandoned application Ser. No. 274,785, July 24, 1972. This application Oct. 18, 1973, Ser. No. 407,767.

Int. Cl. G06f *13/00*
U.S. Cl. 444—1
4 Sheets Drawing. 25 Pages Specification



An algorithm is described which reduces system overhead and enhances system performance by recording (transfer from main store to disk) rolled-out pages in a "page valid" state, i.e. the copy of the page of data is still in main (or real) store and accessible for processing during roll-out. This method eliminates page faults (a determination that the desired page is not available for access in main store) during and after the roll-out cycle. When the recording is completed, the "change" bit (sometimes called "alter" bit) of the page is tested to insure that the recording is accurate (the copy in main store has not been altered during roll-out). If the main store copy of the rolled-out page has been altered, another page is selected for roll-out. If the recording is accurate and a new page is waiting to be rolled in, the main store copy of the rolled-out page is invalidated, and roll-in of a new page overlaying the rolled-out page is initiated. Thus, the page is held valid and available until just prior to its being overlayed with a new page of data.

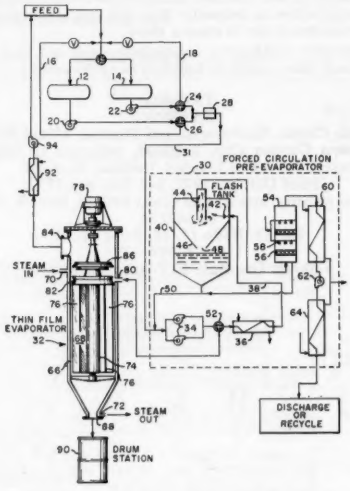
T939,005

SPENT REGENERANT PROCESSING SYSTEM

David Norman Enegess, East Windsor, and Phillip Daniel Paquette, Enfield, Conn., and Hashem N. Elsherif, Cleveland, Ohio, assignors to Combusion Engineering, Inc., Windsor, Conn.

Filed Mar. 20, 1974, Ser. No. 452,857
Int. Cl. C09k *3/00*
U.S. Cl. 252—301.1 W
1 Sheet Drawing. 9 Pages Specification

This invention involves a system for processing liquid wastes containing dissolved solids which result from the operation of a nuclear steam supply system. The processing sequence is to first collect the liquid wastes in hold-up tanks (**12** and **14**). When sufficient volume is collected, the liquid waste is pumped through a filter (**28**) to the first stage of a dual evaporation process. This first stage, the pre-concentrator, consists of a forced-circulation evaporator (**30**) with a very high bottoms-to-distillate decontamination factor. The concentrate from this unit is fed



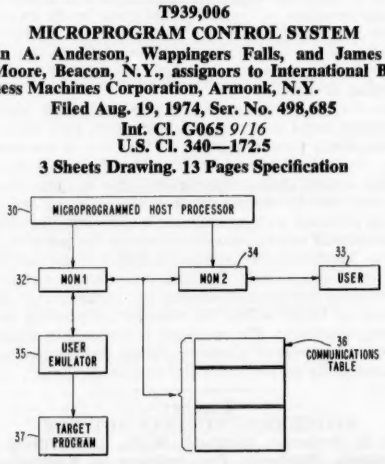
to one of two thin film evaporators (**32**) which further concentrates the liquid waste and discharges solids of low moisture content. The solids are then drummed and shipped off-site for disposal. The distillate produced from the thin film evaporator is recycled back to the original collection tanks in order to maintain a very high overall decontamination factor for the distillate.

T939,006

MICROPROGRAM CONTROL SYSTEM

Alan A. Anderson, Wappingers Falls, and James W. Moore, Beacon, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,685
Int. Cl. G065 *9/16*
U.S. Cl. 340—172.5
3 Sheets Drawing. 13 Pages Specification



In the present invention a microprogramming system for controlling the execution of a microprogram emulator is provided. The microprapramming control system enables a stepping operation to be carried out on the execution of a user microprogram emulator for the purpose of

observing its execution, detecting errors and modifying the emulator microprogram in accordance with user observations.

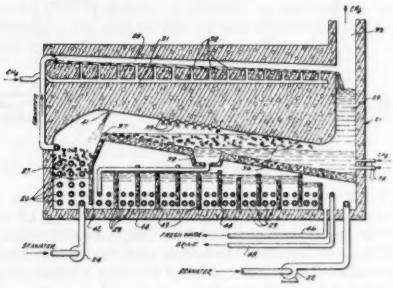
T939,007

METHANE COOLED DESALINATION METHOD AND APPARATUS

Joseph Seliber, Wilmette, Ill., assignor to Pacific Lighting Service Co., Los Angeles, Calif.

Continuation of abandoned application Ser. No. 154,131, June 17, 1971. This application Nov. 13, 1973, Ser. No. 415,431

Int. Cl. E01d *9/04*
U.S. Cl. 62—58
2 Sheets Drawing. 10 Pages Specification



A unitary apparatus is provided within which several functions of an integrated desalination system are performed. Desalination is effected by freezing ice in saline water by direct sparging through **32** of cold natural gas into the saline water in an upper sluice **28** and in the lower portion of a substantially vertical standpipe **29**. The slurry of ice and brine drops from the sluice **28** into the top of the vertical standpipe **29** through which it flows downwardly, and then laterally upwardly in a separation section **36** having means **38** for draining brine from the bottom portion and for removing ice from the top portion. Incoming saline water flows countercurrent in **23** and **26** to fresh water **46** and brine **48** and melts the ice for precooling prior to contact with the natural gas. Within the unitary apparatus of FIG. 1, ice, brine, fresh water, and gas, flow under the influence of gravity, thereby minimizing internal mechanisms. In FIG. 2, after dewatering, the natural gas is expanded through a turbine **17** for producing shaft horsepower useful for pumping seawater and generating electricity.

T939,008

PROCESS FOR PREPARING A POLYESTER FABRIC HAVING DESIRABLE STAIN-RELEASE, ANTI-SOIL-REDEPOSITION, ANTISTATIC AND HYDROPHILIC PROPERTIES

Robert B. Barbee, Rte. 3, Tinker Lane, Kingsport, Tenn. 37664

Filed Nov. 21, 1973, Ser. No. 418,162

Int. Cl. D06m *15/14, 15/36*
U.S. Cl. 8—115.5
No Drawing. 7 Pages Specification

Disclosed is a process for preparing fabrics which exhibit desirable stain-release, antisoil-redeposition, antistatic and hydrophilic properties. According to this process, a fabric comprised of a fiber of poly(ethylene terephthalate) modified with p-carboxycinnamic acid is contacted with acrylic acid and a free radical initiator under grafting reaction conditions.

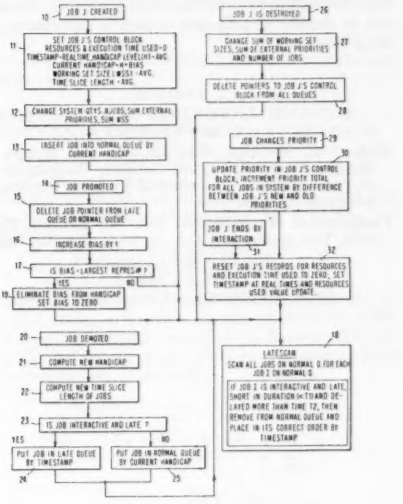
T939,009

SCHEDULING MECHANISM FOR INTERACTIVE SYSTEMS WITH VIRTUAL MEMORY

Donald Dean Chamberlin, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 13, 1974, Ser. No. 450,621

Int. Cl. G06f *9/12*
U.S. Cl. 444—1
5 Sheets Drawing. 7 Pages Specification


JOB J CREATED
SET JOB J'S CONTROL BLOCK RESOURCES & EXECUTION TIME USED=0 TIMESTAMP=REAL TIME, HANDICAP=LEVEL(K)+AVG CURRENT HANDICAP+K*BIAS WORKING SET SIZE=MIN(I·AVG. TIME SLICE LENGTH ·AVG.
CHANGE SYSTEM QTYS JOBS, SUM EXTERNAL PRIORITIES, SUM WSS
INSERT JOB INTO NORMAL QUEUE BY CURRENT HANDICAP
JOB PROMOTED
DELETE JOB POINTER FROM LATE QUEUE OR NORMAL QUEUE
INCREASE BIAS BY 1
IS BIAS > LARGEST REPRESENT ?
YES
NO
ELIMINATE BIAS FROM HANDICAP SET BIAS TO ZERO
JOB DEMOTED
COMPUTE NEW HANDICAP
COMPUTE NEW TIME SLICE LENGTH OF JOBS
IS JOB INTERACTIVE AND LATE ?
YES
NO
PUT JOB IN LATE QUEUE BY TIMESTAMP
PUT JOB IN NORMAL QUEUE BY CURRENT HANDICAP
JOB J IS DESTROYED
CHANGE SUM OF WORKING SET SIZES, SUM OF EXTERNAL PRIORITIES AND NUMBER OF JOBS
DELETE POINTERS TO JOB J'S CONTROL BLOCK FROM ALL QUEUES
JOB CHANGES PRIORITY
UPDATE PRIORITY IN JOB J'S CONTROL BLOCK, INCREMENT PRIORITY TOTAL FOR ALL JOBS IN SYSTEM BY DIFFERENCE BETWEEN JOB J'S NEW AND OLD PRIORITIES
JOB J ENDS BY INTERACTION
RESET JOB J'S RECORDS FOR RESOURCES AND EXECUTION TIME USED TO ZERO, SET TIMESTAMP AT REAL TIMES AND RESOURCES USED VALUE UPDATE.
LATESCAN
SCAN ALL JOBS ON NORMAL Q FOR EACH JOB I ON NORMAL Q
IF JOB I IS INTERACTIVE AND LATE, SHORT IN DURATION (<T) AND DELAYED MORE THAN TIME T2, THEN REMOVE FROM NORMAL QUEUE AND PLACE IN ITS CORRECT ORDER BY TIMESTAMP

A job is created and a job control unit records the amount of main storage required as well as the handicap plus bias which will determine how fast the job will be promoted to the multiprogramming set of jobs currently being performed by the system. Waiting jobs are assigned different handicaps based upon their external priorities. Jobs added later have higher handicaps by the amount of a bias incremented upon each promotion until it is so large that all handicaps must be decremented by the amount of the bias. In this way earlier jobs have lower handicaps with time and eventually even jobs with high initial handicaps receive service at the rate intended with respect to jobs with lower handicaps. Jobs which are interactive and late are placed in a late queue for faster service, to assure interactive users faster service. On demotion a job receives a feedback adjustment of its handicap by means of a K factor adjustment. Jobs are scheduled to provide adequate response time and equitable allocation of system resources.

T939,010

PROGRAM TEST METHOD

Richard Anthony Bender, Hyde Park, and Earl Lee Pottorff, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 249,650, May 2, 1972. This application Mar. 25, 1974, Ser. No. 454,047

Int. Cl. G06f *11/04, 9/06;* **G05b** *17/02*
U.S. Cl. 444—1
26 Sheets Drawing. 127 Pages Specification

A method of analyzing computer programs which are to be tested. The method determines the data flow patterns through a program and uses the data flow patterns to identify a set of paths in the program which must be

exercised in order to verify a program's correctness. The method includes the steps of: partitioning the program source statements into groups (each of which always executes as a serial unit, i.e. serit), determining the execution sequences of the different serial units, determining the data input and output activities of the serial units across their boundaries and the program boundaries, locating the sources of input data to each serial unit, and identifying test paths through the program such that every first-order dependency (each direct source of an input data item provided to each serial unit) is exercised by test data designed to exercise this set of test paths. The method can be applied to programs written in different programming languages.

T939,011
DYNAMIC EXTENSION OF ALLOCATION FOR NEW UNIT

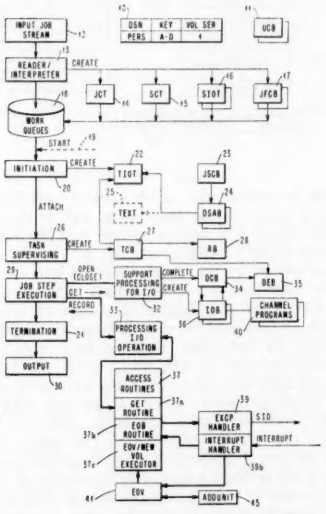
Richard C. Mauceri, Poughkeepsie, and Robert J. St. Germaine and Eugene S. Schulze, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 208,788, Dec. 16, 1971. This application Apr. 19, 1974, Ser. No. 462,271

Int. Cl. G06f *13/00, 9/18*

U.S. Cl. 444—1

15 Sheets Drawing. 35 Pages Specification



A data processing system includes a control program that, during operation thereof, dynamically extends the allocation to a new unit added after the initial allocation associated with a task or job step. This is accomplished by first specifying the volume and device type to be allocated and then by utilizing this information to find a new unit and change various pertinent control blocks and tables to reflect this changed status in such a manner that the processing of any required I/O operation on the new unit is accomplished by using the allocation output. A specific use of this process is also disclosed allowing one user in a data processing system to access additional volumes associated with a data set that have been added to the system by a second user after the task of the first user has been initiated.

T939,012
MANIFOLD FOR FLOW MONITORING MEANS

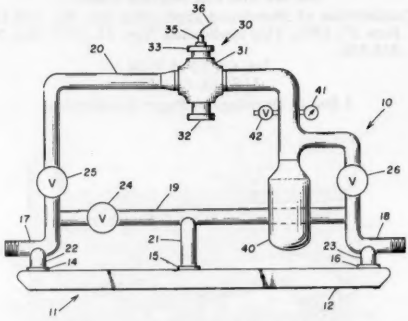
Willett F. Baldwin, Dallas, and Vasel R. Slover, Jr., Irving, Tex., assignors to Mobil Oil Corporation

Filed May 22, 1974, Ser. No. 472,336

Int. Cl. G01n *15/06*

U.S. Cl. 137—599.1

1 Sheet Drawing. 8 Pages Specification



A manifold for mounting a monitoring device, e.g., sand detection probe, in a production flowstream of an oil and/or gas well. The manifold is adapted to be connected into said production flowstream and has a first flowline and a second flowline, the latter forming a bypass of said first flowline. A special fitting is provided in the second flowline by which the monitoring device may be removably mounted into the interior of the second flowline. By appropriate valving, flow can be directed through either the first or the second flowline so that the probe in the second flowline may be isolated from flow to allow the probe to be replaced without requiring the entire production of the well to be shut in.

T939,013
HOT MELT REWETTABLE ADHESIVE COMPOSITIONS

John R. Caldwell, 404 Colonial Heights Road, and John M. McIntire, 4409 Green Spring Circle, both of Kingsport, Tenn. 37663

Filed May 23, 7974, Ser. No. 472,776

Int. Cl. C08k *5/20;* **C09j** *3/14, 5/06*

U.S. Cl. 260—32.6 N

No Drawing. 10 Pages Specification

Adhesive compositions capable of being applied to a substrate in molten form and activated by the application of water are prepared from a mixture of low molecular weight poly(N-alkylacrylamide) and an amide of an aliphatic monocarboxylic or dicarboxylic acid, said amide containing from 2 to 6 carbon atoms per amido nitrogen atom.

T939,014
METHOD AND DEVICE FOR MENDING RUPTURES IN BALLOON-TYPE ARTICLES

Thomas G. Fudge, 2021 Cantebury Road, Kingsport, Tenn. 37660; John J. Murphy, 8 Raphael Place, New Monmouth, N.J. 07748; and Lloyd P. Foster, 916 Scenic Court, Kingsport, Tenn. 37663

Continuation of abandoned application Ser. No. 266,807, June 27, 1972. This application June 11, 1974, Ser. No. 481,573

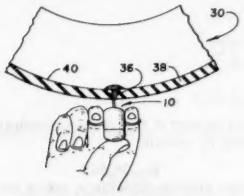
Int. Cl. B29h *5/16*

U.S. Cl. 264—36

2 Sheets Drawing. 9 Pages Specification

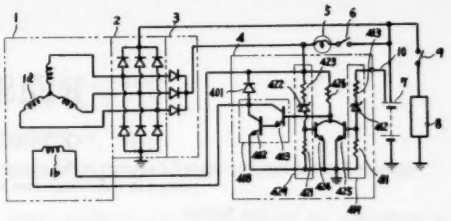
A method and device for mending ruptures in balloon-type articles such as vehicle tires is disclosed wherein

polymerizable cyanoacrylate monomer is extruded into the rupture through a tube or needle. The needle is first inserted into the rupture where extrusion begins and continues simultaneously as the needle is withdrawn. The cyanoacrylate monomer is allowed to polymerize while maintaining the wall portion of said article in the vicinity of said rupture in substantially stationary contact.



T939,015
VOLTAGE REGULATING SYSTEM
Katsumi Itoh, Ohbu, Japan, assignor to Nippondenso Co., Ltd., Aichi-ken, Japan
Filed July 26, 1974, Ser. No. 492,968
Claims priority, application Japan, July 26, 1973, 48/88,505
Int. Cl. H02j 7/14
U.S. Cl. 320—64
1 Sheet Drawing. 6 Pages Specification

In a voltage regulating system, a plurality of voltage sensing circuits are provided to control a voltage generated by an alternator at a predetermined value even when one of the sensing circuits is disconnected or disordered, thus preventing a battery from being over charged perfectly.



T939,016
PRODUCTION OF FLEXIBLE POLYURETHANE FOAM
Ted L. Douglas and Ambrose J. Clonce, Jr., both of Rte. 11, Kingsport, Tenn. 37663
Continuation of abandoned application Ser. No. 401,328, Sept. 27, 1973. This application Oct. 30, 1974, Ser. No. 519,320
Int. Cl. C08g 18/18
U.S. Cl. 260—2.5 AC
No Drawing. 16 Pages Specification

Flexible, resilient polyurethane foam is produced by using, as a curing catalyst, a mixture of 65–83% N,N'-dialkyl-2,4-toluenediamine and 35–17% N-monoalkyl-2,4-toluenediamine, in which the alkyl groups contain from 3–12 carbon atoms.

REISSUES

OCTOBER 7, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

Re. 28,566

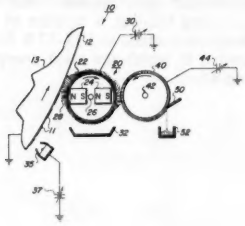
CLEANING APPARATUS

Frank Y. Yang, Hacienda Heights, Calif., assignor to Xerox Corporation, Stamford, Conn.

Original No. 3,580,673, dated May 25, 1971, Ser. No. 755,266, Aug. 26, 1968. Application for reissue May 11, 1973, Ser. No. 378,850

Int. Cl. G03g *15/00*

U.S. Cl. 355—15 **18 Claims**



15. Apparatus for removing electrostatically adhering toner particles from an electrostatic recording surface comprising:

transport means, said transport means being connected to an electrical biasing potential of a polarity opposite that of the toner particles and of a magnitude sufficient to remove toner particles from the recording surface, beads having a triboelectric attraction for the toner particles, said beads being carried by said transport means into sweeping contact with an electrostatic recording surface from which toner particles are to be removed to remove toner particles therefrom onto the beads,

rotatable toner removal means positioned in the path of said transport means coupled to an electrical biasing potential of a polarity opposite that of said toner particles and of a magnitude sufficient to continuously attract said toner particles from said beads onto the surface thereof,

means for removing the electrostatically adhering toner particles from the surface of said toner removal means, and means for receiving the toner removed from the surface of said toner removal means.

Re. 28,567

PHASE AND SPEED CONTROL OF A DC MOTOR

Henri Matthey, La Chaux-de-Fonds, and Jean Jacques Bessire, Bienne, both of Switzerland, assignors to Eresa S.A., Bienne, Switzerland

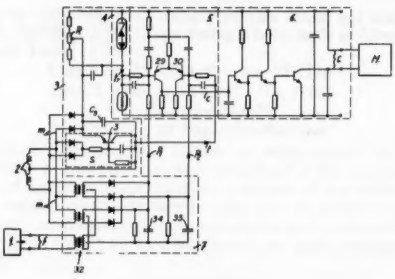
Original No. 3,689,816, dated Sept. 5, 1972, Ser. No. 67,191, Aug. 26, 1970. Continuation of Ser. No. 671,460, Sept. 28, 1967, abandoned. Application for reissue May 29, 1973, Ser. No. 364,620

Claims priority, application Switzerland, Sept. 29, 1966, 14087/66

Int. Cl. 319 *318;* **H02p** *5/16*

U.S. Cl. 318—314 **3 Claims**

1. A control device comprising: circuit means delivering a DC reference velocity signal; reference frequency means delivering an AC reference frequency signal; generator means driven by a motor and delivering an AC generator signal corresponding to the actual speed and phase of the motor; phase responsive circuit means fed by said AC reference frequency signal and by the AC generator signal said phase responsive circuit means having a first position signal output and a second position signal output and being responsive to the phase difference between said AC reference frequency signal and said AC generator signal to produce corresponding DC voltage differences between said position signal outputs; circuit means including a rectifier and a filtering capacitor fed by the AC generator signal and delivering a DC velocity signal corresponding to the actual speed of the motor; differential amplifier means fed on the one hand by the sum of the DC reference velocity signal and the first position signal output,



and on the other hand by the sum of the actual DC velocity signal and the second position signal output; said differential amplifier means delivering a DC control voltage the amplitude of which controls the energy supplied to the motor; and power amplifier means for said DC control voltage, a stabilizing circuit connected in parallel with said capacitor fed by the intermediary of a rectifier by the generator means.

PLANT PATENTS

GRANTED OCTOBER 7, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,792
MINIATURE ROSE PLANT

Ralph S. Moore, Visalia, Calif., assignor of a fractional part interest to Ernest D. Williams, Dallas, Tex.

Filed Aug. 23, 1974, Ser. No. 500,195
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, rounded, much branched, bush type, as illustrated and described, characterized by buds and flowers resembling the "Janna" (Plant Pat. 2,450) miniature rose in general form and size, the color being a deep pink and the individual petals having considerable near white area at base on both upper and lower surfaces; the general color effect being pink; and further characterized by a plant which is of vigorous and relatively compact growth, easy to propagate from cuttings, with moderately small, leathery, semi-glossy foliage; an abundance of bloom, with flowers borne singly or several to stem in loose cluster.

3,793
APPLE ROOTSTOCK

Henry M. Tydeman, East Malling, England, assignor to National Seed Development Organisation Limited

Filed July 23, 1974, Ser. No. 490,956
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—34 **1 Claim**

1. Apple rootstock of the dwarfing type, substantially as illustrated and described, produced as a seedling by pollinating flowers of the apple rootstock Malling 13 with pollen from the apple rootstock, Malling 9, and characterized as an exceptionally dwarf rootstock.

PATENTS

GRANTED OCTOBER 7, 1975

ERRATA

For CLASS	See PATENT NO.
228–160	3,909,915
228–216	3,909,917
111–077	3,910,217
239–587	3,910,320
340–172.5	3,910,322
058–074	3,910,362
243–006	3,910,523
318–562	3,911,316
328–014	3,911,329
328–037	3,911,330
328–075	3,911,331
357–005	3,911,333
426–051	3,911,103

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U.S. Cl.

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PATENTS

GRANTED OCTOBER 7, 1975

GENERAL AND MECHANICAL

3,909,846

SUSPENSION FOR HARD PROTECTIVE HAT OR THE LIKE

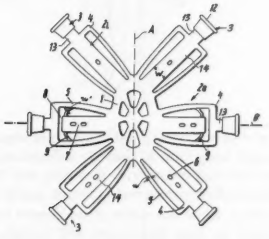
Christian Zahn, Braunschweig, Germany, assignor to Schuberth-Werk, Braunschweig, Germany

Filed May 10, 1974, Ser. No. 468,805

Claims priority, application Germany, May 12, 1973, 2324143

Int. Cl.[2] A42B *1/08*

U.S. Cl. 2—3 R **7 Claims**



1. A suspension for mounting a head band in a shell of a hard protective hat, said suspension comprising:

a crown piece adapted to overlie the wearer's head;

a plurality of arms formed integrally with and extending outwardly from said crown piece;

respective attachment feet each provided at the outer end of a respective arm and adapted to be secured to said shell, at least two of said arms extending from said piece in opposite directions;

respective bands reaching outwardly from said crown piece along each arm of said two arms and having a free outer end spaced from the respective foot, said suspension being adapted to be attached to said head band; and

respective connecting members each having one end attached to the outer end of a respective one of said bands and another end attached to the respective foot, each of said members being formed at least partially as a flexible ligature extending transverse to and being of smaller cross section than the respective arm and band.

3,909,847

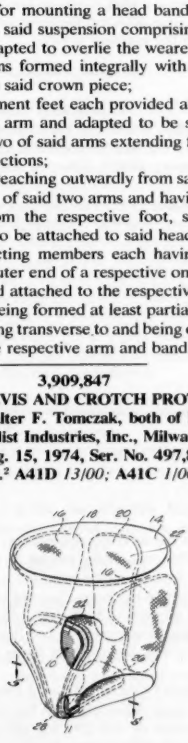
FEMALE PELVIS AND CROTCH PROTECTOR

M. C. Holt, and Walter F. Tomczak, both of Leesburg, Fla., assignors to Medalist Industries, Inc., Milwaukee, Wis.

Filed Aug. 15, 1974, Ser. No. 497,813

Int. Cl.[2] A41D *13/00;* **A41C** *1/00*

U.S. Cl. 2—2 **6 Claims**



1. A female pelvis and crotch protector comprising an hourglass shaped pad of shock absorbent material having enlarged front and rear portions and a narrow interconnecting neck extending therebetween, and means for holding said pad in place on a female's body with said front portion being positioned over the female's front pelvic region and said rear portion being positioned under the female's rear pelvic region and said neck portion being positioned under the female's crotch, said pad being made of an inner flexible cushion layer, an outer flexible shield layer, and means laminating said layers together, said shield layer being substantially more rigid and tougher than said cushion layer to provide protection from relatively hard shocks, and said cushion layer being sufficiently soft to absorb shock loads.

3,909,848

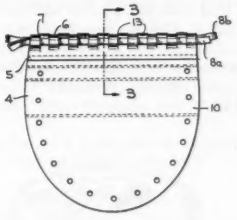
WEB FOR SPORTING GLOVE

Larry J. Brockman, Nocona, Tex., assignor to Nocona Athletic Goods Company, Nocona, Tex.

Filed Feb. 18, 1975, Ser. No. 550,520

Int. Cl.[2] A41D *13/10*

U.S. Cl. 2—19 **5 Claims**



2. A baseball glove having at least two stalls comprising: a web section attached between said stalls, said web section being formed of a sheet of material having one edge portion facing away from said glove; said edge portion being folded over; a plurality of substantially parallel slits being formed within said folded edge portion so as to form a plurality of looped sections; alternate ones of said looped sections being offset so as to form two rows of said looped sections; a first lace passing through said first row of said looped sections; and, a second lace passing through said second row of said looped sections.

3,909,849

JUMP-SUIT STYLE COVERING GARMENT

A. C. Botha, Durban, South Africa, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 27, 1973, Ser. No. 368,432

Int. Cl. A41d *13/02*

U.S. Cl. 2—79 **4 Claims**

1. A jump-suit style covering garment having a waistline, a crotch and a fly, said garment comprising

a windproof and waterproof body covering portion for covering a wearer from neck to wrists and ankles, said body covering portion having wrist parts, ankle parts, a neck part, a zipper from the neck part to the crotch, a watertight flap section on the inside of the zipper and wider than the zipper, and a strip of material overlapping the zipper on the outside of the garment;

windproof and waterproof gloves removably affixed to the wrist parts of the body covering portion for covering a wearer's hands;

waterproof shoe covers removably affixed to the ankle parts of the body covering portion;

a windproof and waterproof head cover removably affixed to the neck part of the body covering portion; and

an elastic watertight cover secured and sealed off on the inner side of the garment at the front between the waist-

line and the crotch to prevent water seepage through the fly of the garment.

3,909,850

SHIRT COLLAR SECURING ARRANGEMENT

Julian Scott, 225 E. 57th St., New York, N.Y. 10022

Continuation of Ser. No. 337,207, March 1, 1973, abandoned. This application Feb. 20, 1975, Ser. No. 551,504

Int. Cl.[2] A41B *3/00*

U.S. Cl. 2—132 **5 Claims**

1. A shirt construction comprising:

a shirt body;

a collar attached to said body; and

means for securing a tip of said collar to the shirt body, said securing means including:

a semi-rigid collar stay having an upper end retained on the underside of said collar and having an exposed lower end adjacent said tip; and

means on said shirt body located immediately adjacent the collar tip when the collar is lying against the shirt body in its normal position of wear for slidably receiving said exposed lower end of the stay and holding same to the shirt body to thereby secure the tip to the shirt body while permitting relative movement between the collar tip and the shirt body.

3,909,851

PANTY HOSE WITH TERRY LOOP CROTCH INSERT

Philip H. Garrou, and William D. Schubert, both of Valdese, N.C., assignors to Pilot Research Corporation, Valdese, N.C.

Filed Sept. 5, 1974, Ser. No. 503,292

Int. Cl.[2] A41B *9/04*

U.S. Cl. 2—224 R **5 Claims**

1. A panty hose garment including a pair of seamless tubular legs, a panty portion formed of extensions integrally knit with said legs, said extensions being longitudinally slit and seamed together, and an insert secured between the edges of said extensions and in at least the crotch portion of said panty, said extensions being knit of stretchable synthetic yarn, said insert including weft knit courses and wales knit of stretchable synthetic body yarn having substantially the same affinity for dye as said stretchable synthetic yarn of which said extensions are knit so that the finished appearance of said insert is substantially the same as adjacent portions of said extensions, said insert including terry loops on the inner surface thereof and

being knit of a yarn having greater moisture absorbency properties than said body yarn to provide softness and absorbency in the crotch of said panty hose garment, and the courses of said insert extending transversely thereof and from one extension to the other while the wales of said insert extend longitudinally thereof so that said insert will stretch to a greater extent in the transverse direction than in the longitudinal direction to prevent undue stress on the fabric of said extensions and in the areas adjacent the lower ends of the slits in the extensions when the garment is worn.

3,909,852

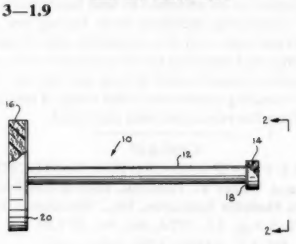
IMPLANTABLE SUBSTITUTE STRUCTURE FOR AT LEAST PART OF THE MIDDLE EAR BONY CHAIN

Charles A. Homsy, 11526 Raintree Circle, Houston, Tex. 77024

Filed Dec. 17, 1973, Ser. No. 425,105

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.9 **14 Claims**



1. A structure for in vivo implantation comprising

a biocompatible columella having a suitable length and transverse dimensions for implantation as a substitute for at least a part of the bony chain of the middle ear,

a porous pad secured to both ends of said columella,

said pads being biocompatible and having the characteristics of promoting ingrowth of living tissue therein when implanted,

one of said pads being of sufficient thickness so that when positioned against the eardrum the tissue of the eardrum becomes a part of said pad for efficient transmission of vibrations and without atrophy of said eardrum, and

the other of said pads being adapted to secure said columella in position to transmit vibrations to the oval window when implanted.

3,909,853

ENDOPROSTHETIC WRIST JOINT

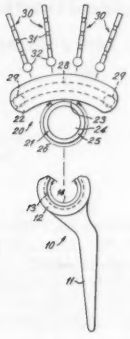
William Murdoch Lennox, Cheltenham, England, assignor to National Research Development Corporation, London, England

Filed May 15, 1974, Ser. No. 470,292

Claims priority, application United Kingdom, May 22, 1973, 24406/73

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.91 **9 Claims**



5. An endoprosthetic wrist joint device comprising:

a radial component having a fixation part for securement with the radius, and a bearing part;

a generally T-shaped carpal component having a first bearing part connected with said radial bearing part in mutually articulatory ball-and-socket bearing engagement, a necked part extending from said first bearing part, and an elongated second bearing part connected at an intermediate location therealong to said necked part and extending transversely relative to said necked part; and

a plurality of metacarpal components each having a fixation part for securement to a respectively individual metacarpal, and each having a bearing part connected with said second bearing part in individual mutually articulatory ball-and-socket bearing engagement.

3,909,854

KNEE IMPLANT PROSTHESIS

Ysidore M. Martinez, 5608 Lakewood Dr., La Mesa, Calif. 92041

Continuation-in-part of Ser. No. 356,816, May 3, 1973, Pat. No. 3,848,276. This application Nov. 18, 1974, Ser. No. 524,708

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.911 **14 Claims**

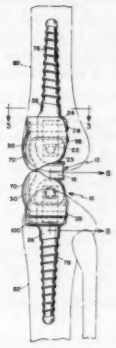
1. A knee prosthesis comprising joint means for controlled flexion, rotation, and abduction-adduction movements:

attachment means for securing said joint means between relatively movable skeletal members,

said joint means comprising two relatively spaced apart flexure pivot bearings journaled in a common pivot body and upper and lower pivot roller elements carried by said flexure pivot bearings,

said pivot body and said pivot roller elements having cooperating arcuate surfaces in relatively sliding engaging relationship,

each of said attachments means being secured to each of said pivot rollers for a limited relative rotation about an abduction-adduction axis and a rotation axis, which axes



are mutually orthogonal with the axis of said pivot bearing.

3,909,855

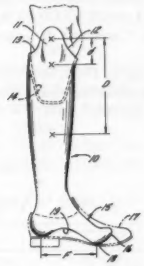
BELOW-THE-KNEE PROSTHESIS

Joseph G. Barredo, 2131 Wyoming Ave. N.W., Washington, D.C. 20008

Filed Nov. 12, 1974, Ser. No. 523,375

Int. Cl.[2] A61F *1/08, 1/02*

U.S. Cl. 3—16 **4 Claims**



1. A walking prosthesis for fitting a below-the-knee stump comprising a hollow, one-piece, rigid, lightweight leg corresponding generally in form to the human leg having a socket fitted to receive the stump, and with a weight several times less than that of the natural leg and the foot portion shortened at the toe end by an amount approximating the natural toe length.

3,909,856

DUAL FLUSH TANK VALVE

Ray A. Dunn, Jr., Fairfax, Va., assignor to Barney Elias; Robert H. Caldwell, both of Jacksonville, Ill. and Edward Elias, Springfield, Va., part interest to each

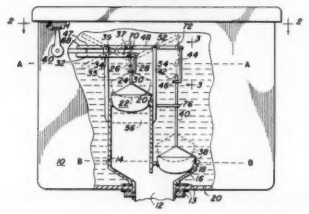
Filed Aug. 19, 1974, Ser. No. 498,733

Int. Cl.[2] A61B *19/00;* **E03D** *1/34, 5/02*

U.S. Cl. 4—67 A **2 Claims**

1. A toilet flush tank valve assembly wherein a selective volume of water may be flushed into a toilet bowl comprising a flush tank, a discharge pipe having communication with a toilet bowl, a first conduit extending vertically upwardly from said discharge pipe into the interior of the flush tank and being

offset therefrom and communicating therewith, a second conduit extending vertically upwardly from said pipe, offset from said first conduit and said pipe and communicating with said pipe, said second conduit terminating closely adjacent the bottom of said tank, valve means seated on the open ends of said conduits, a series of pivoted link arms for optionally opening one or the other of said valves, said link arms positioned in horizontal planes, one below the other and each link arm having a free end, a shaft extending interiorly into said



tank and connected at one end to a handle positioned exteriorly of said tank, a flat plate secured to said shaft and extending at right angles thereto, whereby the free ends of said links lie against the upper and lower faces of said plate respectively whereby upon movement of said plate in an upward direction, the upper link arms will actuate the valve on said second conduit to flush a full tank of water and when the plate is shifted downwardly, it will actuate the valve on said first conduit to flush a half tank of water, and handle means to operate said plate.

3,909,857

DAMPED ARTICULATION DEVICE FOR SWIVEL-MOUNTED FURNITURE

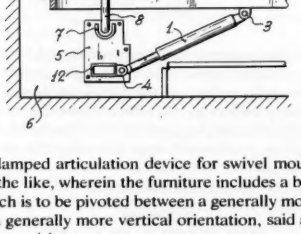
Jose Pardo Herrera, Carretera de Logrono, Km. 1, 7, Zaragoza, Spain

Filed Aug. 5, 1974, Ser. No. 494,995

Claims priority, application Spain, Jan. 15, 1974, 199516

Int. Cl.[2] A47C *19/00*

U.S. Cl. 5—164 R **5 Claims**



1. A damped articulation device for swivel mounted furniture, or the like, wherein the furniture includes a beam, or the like, which is to be pivoted between a generally more horizontal and a generally more vertical orientation, said articulation device comprising:

an anchoring means; articulation support lugs carried by said anchoring means;

a telescopable damping cylinder and telescopable extensible damping rod assembly with said rod extending from and telescoping into said cylinder; said assembly being provided to serve as a balancing means for the weight of the furniture, or the like; one end of said assembly being articulatedly connected at a location along said beam, such that said assembly might articulate with respect to said beam as said beam is pivoted; the opposite end of said assembly being articulatedly connected to said articulation support lugs such that said assembly might articulate with respect to said lugs as said beam is pivoted;

beam pivot means spaced from said ends of said assembly and pivotally supporting said beam to pivot about an axis; said assembly extending in a direction across the direction of said axis.

3,909,858

SUPPORT APPLIANCES

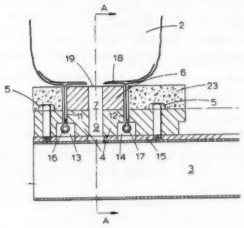
Frank Edward Mayhew Ducker, London, England, assignor to Watkins & Watson Ltd., London, England

Filed July 23, 1973, Ser. No. 381,646

Claims priority, application United Kingdom, July 21, 1972, 34197/72

Int. Cl.[2] A47C *27/08;* **A61H** *1/00*

U.S. Cl. 5—348 R **10 Claims**



1. A support appliance which comprises

a. a plurality of elongated tubular members;

b. a plurality of elongated inflatable cells, each arranged parallel to one of said tubular members;

c. means mounting each said cell on the respective tubular member;

d. separate inlet and outlet apertures extending through the wall of said cell and through the adjacent wall of the respective tubular member; and

e. a layer of foam rubber positioned between each said cell and said respective tubular member, said inlet and outlet apertures extending through the wall of said cell, through said foam rubber and through the adjacent wall of the respective tubular member;

f. whereby a continuous flow of pressurized air may be maintained in each of said cells between the inlet and outlet apertures thereof.

3,909,859

THERAPEUTIC WATER MATTRESS

Betty R. Harris, Pittsburg, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed July 8, 1974, Ser. No. 486,334

Int. Cl.[2] A61G *7/02;* **A47C** *27/08*

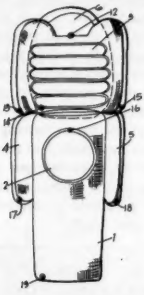
U.S. Cl. 5—348 WB **3 Claims**

1. A therapeutic water mattress, comprising

a mattress envelope having water therein and an open tub portion formed therein for bathing part of a person on the mattress envelope;

a back rest envelope having water therein and extending from an end of the mattress envelope in the area of the tub portion thereof at an angle therewith; and

a pair of arm rest envelopes having water therein and extending from opposite sides of the mattress envelope



substantially perpendicularly thereto and abutting the back rest envelope.

3,909,860

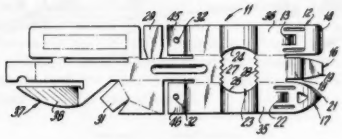
COMBINATION CAN-OPENER TOOL

Joseph Cantales, 640 Pelham Rd., New Rochelle, N.Y. 10802

Filed Sept. 3, 1974, Ser. No. 502,402

Int. Cl.² B25F *1/00;* **B67B** *7/44*

U.S. Cl. 7—14.25 **7 Claims**



1. A combination can opener-type tool made from a single stamping comprising:

a bottle opener and can piercer facing in opposite directions at one end of the stamping and a lid opener separating the bottle opener and a can piercer which extend downwardly from the plane of the lid opener;

an intermediate portion of the stamping including an aperture having internal teeth on at least one wall thereof to facilitate opening bottles;

at least one guard means projecting outwardly from the intermediate portion for gripping purposes; and

a can opener having a piercing and cutting element and a guide element spaced therefrom and a curved portion coupled to said guide portion, said curved portion having an elongated aperture therein with cutting surfaces on elongated walls thereof.

3,909,861

ALUMINUM CHLORHYDROXIDE CATALYST SYSTEMS FOR TREATMENTS TO GIVE WRINKLE RESISTANT TEXTILES

Robert M. Reinhardt, New Orleans; Norton A. Cashen, and Wilson A. Reeves, both of Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 5, 1973, Ser. No. 404,042

Int. Cl.² D06M *13/34;* **B01J** *27/06, 23/08*

U.S. Cl. 8—184 **14 Claims**

1. In a method of preparing wrinkle resistant, cellulose-containing textile wherein said textile is (a) impregnated with a solution consisting essentially of water, a catalyst and a finishing agent selected from the group consisting of formaldehyde and formaldehyde-amide adducts, (b) dried and cured, and (c) washed, the improvement comprising the use of aluminum chlorhydroxide complexes of the formula $Al_2(OH)_nCl_{6-n}$, wherein n has a value of 2-5, as said catalyst.

3,909,862

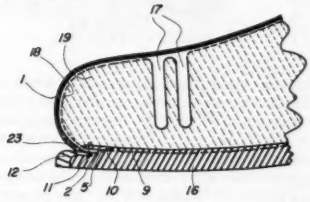
FOOTWEAR AND ITS MANUFACTURE

Horace Ray Auberry, and Anton Liebscher, both of Waynesville, N.C., assignors to Ro-Search, Incorporated, Waynesville, N.C.

Continuation-in-part of Ser. No. 354,542, April 26, 1973, abandoned. This application Sept. 6, 1974, Ser. No. 503,685

Int. Cl.² A43D *9/00*

U.S. Cl. 12—142 R **12 Claims**



1. The method of manufacture of footwear with an upper of stretchable material such as leather, which includes the steps of placing the upper onto a last, stretchforming said upper by pulling the bottom margin thereof, holding said upper under tension of said stretchforming and stabilizing the bottom margin at least along the featherline by securing a welt to the upper at the lasting margin to properly position the upper in a sole molding cavity, and then so positioning the upper in the sole molding cavity by the stabilized bottom margin, and molding a sole of elastomeric material to the upper.

3,909,863

BRIDGE CRANE GIRDER

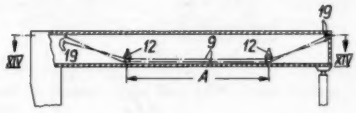
Karl Macrander, and Heinrich Kessel, both of Wilhelmshaven, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Germany

Filed Aug. 17, 1973, Ser. No. 389,357

Claims priority, application Germany, Sept. 11, 1972, 2244566

Int. Cl.² E04C *3/02*

U.S. Cl. 14—17 **8 Claims**

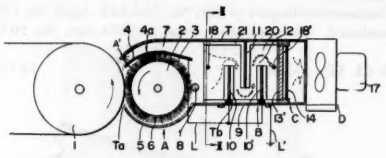


1. A bridge crane girder of steel with great span width, especially of the box type construction, which has an upper cord and a lower cord, and pre-loaded cable means combined with said girder at least in part for reinforcement against force in horizontal direction and relieving at least said lower cord, said pre-loaded cable means being arranged completely within the profile of said girder, said pre-loaded cable means having a central section extending closely along a central section of said lower cord and having end sections respectively ascending from the ends of said central section of said pre-loaded cable means at least approximately toward the ends of said upper cord, said pre-loaded cable means being combined to form cable bundles, and saddle means rotatably mounted at the ends of said central section of said lower cord and deviating said cable bundles upwardly.

3,909,864
RESIDUAL TONER REMOVING APPARATUS

Susumu Tanaka, Sakai; Hidetoshi Kawabata, Tondabayashi, and Yuji Enoguchi, Higashiosaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Jan. 24, 1974, Ser. No. 436,373
Claims priority, application Japan, Jan. 30, 1973, 48-12575
Int. Cl.[2] A47L *5/38, 13/40;* **G03G** *15/00*
U.S. Cl. 15—1.5 **7 Claims**

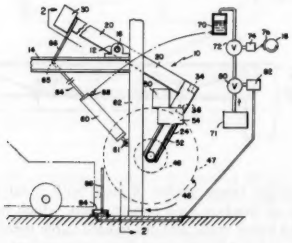


1. In a residual toner removing apparatus which comprises a cleaner section, a dust collection section, and a filter section followed by a suction section, the improvements which comprise brush bristles of a cleaner brush cylinder rotatably provided in said cleaner section being adapted to rub against an upper casing plate at an approximately middle portion thereof for charging said brush bristles with the same polarity as toner particles, and said upper casing plate with opposite polarity to said brush bristles, and said cleaner brush cylinder being provided between said upper casing plate and a lower casing electrically insulated from each other with a fixed distance between tips of said brush bristles and said lower casing, said toner particles wiped off a photoreceptor surface by said brush bristles being electrically repelled from said brush bristles and simultaneously fed into a subsequent dust collecting section by an air flow produced by a suction in said suction section, and dust collecting plates provided in said dust collecting section, said dust collecting plates being electrically connected to said charged upper casing plate for attracting said toner particles to said dust collecting plates.

3,909,865
CAR WASH APPARATUS

Kurt P. Scheuermann, 211 Eastbourne Terrace, Moorestown, N.J. 08057

Filed Aug. 27, 1973, Ser. No. 391,627
Int. Cl.[2] B60S *3/06*
U.S. Cl. 15—21 D **10 Claims**

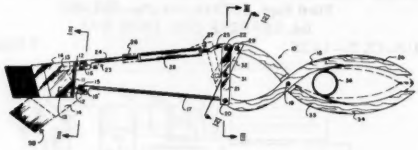


1. For use in a car wash in which a car is moved along a path of travel through the car wash and past a cleaning station for the front bumper and grill and for the top portion of the car, apparatus for supporting a rotating brush at said station comprising pivot means located above the path of travel of the car, means supporting said pivot means at a fixed location, a brush supporting frame means pivotally mounted on said pivot means, said frame means having means for rotatably supporting a brush extending on a horizontal axis transversely across the path of travel of the car and support arm means having a first portion rotatable about said pivot means and extending from said pivot means in the direction of car travel and a second portion turned downwardly to said horizontal axis of said brush for supporting said means for rotatably supporting the brush, said support arm means being constructed and arranged to move said brush from a lower position near the ground whereat said brush is in position to clean the front bumper of the car upwardly and forwardly in the direction of car travel to an upper position above the top portion of the car whereat said brush is in position to clean said top portion, means for rotating said brush into the front portion of the car with the periphery of the brush moving upwardly thereacross as the car moves into the brush, and control means responsive to the movement of the front bumper of the car into contact with the brush for applying a force to said frame to overcome the frictional forces produced by said brush engaging the front bumper for raising said brush.

3,909,866
ARTICULATING PAINT BRUSH

Cliff H. Pringle, London, Canada, assignor to Hugh Gerald MacKichan, London, Canada

Continuation-in-part of Ser. No. 258,003, May 26, 1972, abandoned. This application Nov. 26, 1973, Ser. No. 418,963
Int. Cl. A46b *13/08*
U.S. Cl. 15—22 R **2 Claims**



1. An articulatable paint brush comprising:

a. a brush carrying member having bristles and means for connecting said brush carrying member to first and second brush pivot means;

b. two handle members each extending respectively from a handle portion to a free end with handle pivot means joining the handle members together at a position between the free ends and said handle portions;

c. bias means for urging the handle portions respectively away from each other;

d. a lever member including a fulcrum, load point and effort point having its effort point located between the fulcrum and said load point, the fulcrum pivotly connected to one of said free ends;

e. an effort member pivotly connected between the other of said free ends and the effort point;

f. a pair of longitudinal members, one of said longitudinal members pivotly connected between the fulcrum and the first brush pivot means, the other of said longitudinal members pivotly connected between said load point and said second brush pivot means.

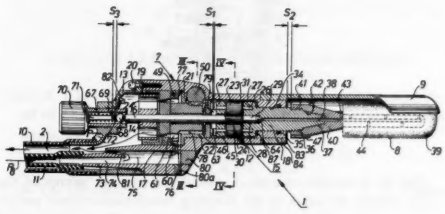
3,909,867
HYDRAULIC PRESSURE DRIVEN ROTARY TOOTHBRUSH

Gunnar Hogsell, Boplatsvagen 6, S-291 65 Kristianstad, Sweden

Filed Sept. 13, 1974, Ser. No. 505,986
Claims priority, application Sweden, Sept. 20, 1973, 7312796
Int. Cl.[2] A61C *17/02;* **A46B** *13/06*
U.S. Cl. 15—24 **15 Claims**

1. A rotary toothbrush comprising a housing shaped to be hand gripped and an interchangeable brush means, a motor

means operable by hydraulic pressure mounted in the housing, a rotary shaft means operably associated with the motor means for rotation about the axis of the shaft means, the shaft means projecting from the housing and the brush means being detachably mounted thereon, the housing defining chamber means, an inlet for water under pressure and a water outlet, whereby water supplied under pressure through the inlet and flowing through the housing chamber means operates the motor means and rotates the shaft means, water flow control



means arranged to control the water flow for blocking it from the motor means, rotating the shaft means in a first direction and reversing the rotational direction, channel means in the rotary shaft means and the brush means in communication with the chamber means for receiving rinsing water therefrom and conveying it to the brush means, and means causing a pressure reduction in the housing chamber means between the motor means and the water outlet for assisting drainage of waste water from the motor means.

3,909,868

CYLINDRICAL HAIR BRUSH

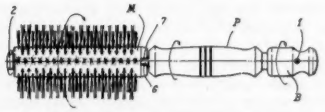
Pierre Robert Nogues, Hotel Hermitage, Monte Carlo, Monaco

Filed Feb. 26, 1974, Ser. No. 445,926

Claims priority, application France, Feb. 26, 1973, 73.08197; May 30, 1973, 73.21160

Int. Cl.[2] A46B *15/00*

U.S. Cl. 15—27 **10 Claims**



1. A cylindrical hair brush comprising a hub having brush bristles thereon, a straight shaft on which said hub is rotatable, and a handle and an operating knob on said shaft, said hub and handle and knob being coaxial, one of said handle and operating knob being fixedly secured to the shaft, the other of said handle and operating knob being slidable on the shaft, and coupling means between said hub and said other of said handle and operating knob for selectively coupling said hub to and uncoupling said hub from said other of said operating handle and knob.

3,909,869

FLOOR SWEEPER

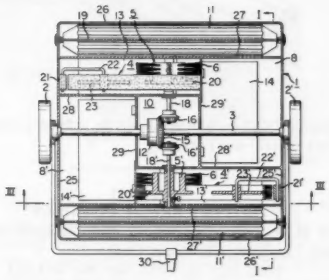
Hiroshi Hukuba, Nagarayama; Masumi Ando, and Takubi Kubota, both of Nagareyama, all of Japan, assignors to Kabushiki Kaisha Hukuba Future Research, Nagarayama, Japan

Filed May 28, 1974, Ser. No. 473,837

Claims priority, application Japan, May 28, 1973, 48-59594; Jan. 28, 1974, 49-11638

Int. Cl.[2] A47L *11/22*

U.S. Cl. 15—49 R **4 Claims**



1. A floor sweeper, comprising a housing defining a recess therein and whose bottom edge is equipped with a flexible seal member devised to be in sliding contact with the floor surface, wheels supporting said housing, said wheels being mounted on shaft means supported within the housing and defining an axis perpendicular to the direction of travel of the housing, a follow-shaft supported on each side of said axis and perpendicular to said axis, means for interconnecting said shaft means and the follow-shafts for rotating the follow-shafts in opposite directions upon rotation of said shaft means, a main pulley mounted on each follow-shaft, a sub-pulley spaced from each said main pulley and mounted for rotation in the same plane as said main pulley, a belt brush on each main pulley and stretched between each said main pulley and said aligned sub-pulley, dust receivers formed in the recess within the housing and positioned adjacent said belt brushes to receive floor sweepings from said belt brushes, each said belt brush including a flexible endless belt and a multiplicity of bristles having a relatively weak resilience as densely set up on said endless belt, and a cylindrical brush fixed on each follow-shaft so as to be adjoining a portion of the belt brush located on the main pulley, said cylindrical brush including a cylindrical body and plural rows of bristles having a relatively strong resilience as set up on the circumference of said cylindrical body by spacing said rows along the radial direction.

3,909,870

CLEANING DEVICE WITH SQUEEGEE ADAPTER

Ragnvald G. Leland, P.O. Box 4174, Palm Springs, Calif. 92262

Filed July 26, 1974, Ser. No. 492,212

Int. Cl.[2] A47L *1/08, 13/12, 13/257;* **B25G** *3/38*

U.S. Cl. 15—121 **10 Claims**

6. A cleaning device which comprises:

an applicator head including a head plate;

a handle pivotably mounted on said head plate;

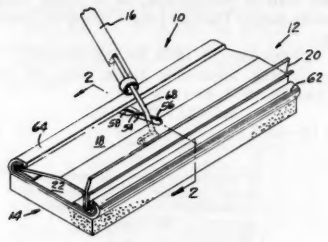
a retaining plate overlying the head plate and having means engageable with said head plate to lock said retaining plate to said head plate;

said retaining plate including an elongated slot therein through which said handle passes;

said slot having detent means extending inwardly therefrom defining first and second slot portions into which said handle is selectively positionable in corresponding first and second cleaning positions;

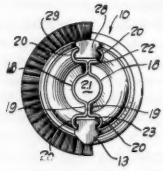
said slot portions being so proportioned with respect to said handle, said retaining plate and said head plate that in

said first cleaning position said handle is freely movable in said first slot portion while in said second cleaning



position said handle is locked in a fixed position within said second slot portion.

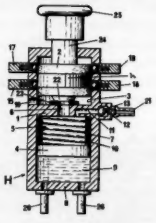
3,909,871
ROTARY BRUSH ASSEMBLY
Russell H. R. Parker, Cleveland, Ohio, assignor to Superior Brush Company, Cleveland, Ohio
Filed July 18, 1973, Ser. No. 380,213
Int. Cl. A46b *3/04, 9/02, 9/10*
U.S. Cl. 15—182 **2 Claims**



1. A rotary brush assembly comprising a pair of elongated, symmetrical metal members, each of said members including as an integral structure a center portion, radially extending webs along both longitudinal edges of said center portion and a channel-defining portion along the outer edge of each web, said webs of both members being secured together in face-to-face contact with said center portions being spaced apart to define a shaft opening extending the length of said assembly and with said channel-defining portions cooperating to form diametrically opposed channels, each of said channels having a closed bottom at the outer edge of the connecting web, spaced side-walls extending radially outwardly from said bottom and a mouth which is open along the length of said assembly, and a flexible strip means seated in each channel and engaged between the sidewalls thereof.

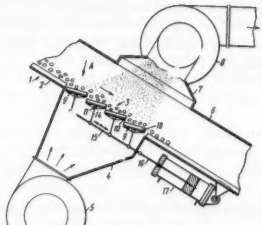
3,909,872
WINDSHIELD WASHER PUMP
Henri Charles Molenaar, Stevinstraat 177, Den Haag, Netherlands
Filed Dec. 10, 1973, Ser. No. 423,643
Int. Cl.[2] B60S *1/46;* **F04B** *12/00*
U.S. Cl. 15—250.02 **28 Claims**

11. A suction operated windshield washer pump having a pumping chamber with an ambient air inlet valve means and a manual outward-pulling operating handle means which is connected to said valve means through a windshield wiper operating switch; said pump including a closed chamber having a pumping member dividing said chamber into first and second portions and moveable in said chamber for drawing washing liquid into and discharging the liquid from said first portion; a suction duct connecting with the interior of the second portion of said chamber for reducing the pressure therein and for actuating said pumping member to draw said liquid into said second portion; wall means defining an enclosure for said switch means; an ambient air inlet duct, controlled by said ambient air inlet valve means, connecting between the interior of the second portion of said chamber and the exterior thereof by a path which does not extend through said switch means.



24. In a suction-operated windshield washer pump of the type which includes in its housing windshield wiper switch means and ambient air inlet valve means, the improvement characterized in that the device has a manual operating handle means or knob with (a) longitudinally inward and outward positions for actuating said pump and said windshield wiper switch means and (b) a plurality of rotational positions for operating only said windshield wiper switch means.

3,909,873
DEVICE FOR DEDUSTING LOOSE MATERIALS
Alexandr Nikolaevich Minasov, ulitsa Ivanova 12/16, kv. 59, and Nikolai Viktorovich Florinsky, vezd Trinklera 5, kv. 76, both of Kharkov, U.S.S.R.
Continuation of Ser. No. 388,411, Aug. 15, 1973, abandoned. This application Aug. 22, 1974, Ser. No. 499,523
Int. Cl.[2] A47L *5/14*
U.S. Cl. 15—306 B **3 Claims**



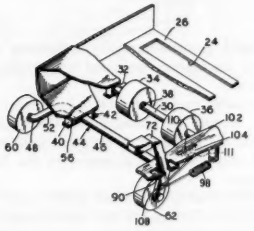
1. A device for dedusting loose materials, comprising: an inclined trough having side walls, a top and a bottom along which loose material travels downwards; a lower opening in the bottom of said trough; an upper opening in said top above the lower opening; a slot type grate mounted in said lower opening, said grate including separate parallel strips, the top surfaces of said strips being arranged in a descending step-like fashion perpendicular to the longitudinal axis of said trough for transferring the material step-by-step across said lower opening to the lower side thereof, said strips being mounted for simultaneous rotation about the longitudinal axes thereof to adjust the width of slots provided between and formed by said strips; a duct outlet connected to said lower opening to deliver compressed air from a source to the inner space of said trough via the slots between said strips of the grate; a source

of suction connected to said upper opening to extract the mixture of air with dust particles of bulk material from the inner space of said trough, with the mixture being created when an upward flow of compressed air passes through the bed of material travelling across said strips and slots along the trough.

3,909,874
VACUUM CLEANER WITH NOZZLE HEIGHT ADJUSTING MECHANISM

Earl R. Clowers; Walter G. Azelkas, and Donald W. Carnes, all of Anderson, S.C., assignors to The Singer Company, New York, N.Y.

Filed Dec. 13, 1973, Ser. No. 424,510
Int. Cl.[2] A47L *5/34*
U.S. Cl. 15—339 **7 Claims**



1. A nozzle height adjusting mechanism for a suction cleaner having a chassis including a suction nozzle inlet at the bottom thereof and first and second sets of wheels supporting said chassis for movement on a floor surface, said mechanism comprising: first axle means including a central portion journaled on said chassis and having offset arms formed on opposite ends of said central portion for journaling said first set of wheels, second axle means longitudinally spaced from said first axle for journaling said second set of wheels on said chassis, an adjustment lever having one end mounted on an offset arm of said first axle means and having a manually engageable free end extending through said chassis at a location longitudinally spaced from said central portion, said adjustment lever having a plurality of spaced teeth, a locking plate mounted on the chassis, and spring means biasing said lever in the longitudinal direction toward said central portion on said plate to lock a selected tooth against the plate.

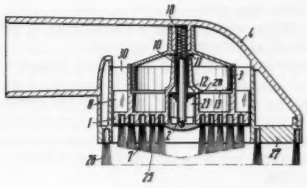
6. A nozzle height adjusting mechanism as recited in claim **1** including a nozzle height position indicator, said indicator comprising an elongated aperture formed in the chassis, means defining indicia along said aperture, a rod mounted at one end on the adjustment lever, the other end of said rod being entrapped within said aperture and slidable relative thereto.

7. A nozzle height adjustment mechanism as recited in claim **6** wherein said other end of said rod comprises a substantially C-shape bend, one leg thereof being disposed above the chassis, the other leg being disposed below the chassis, and pointer means formed on said above the chassis.

3,909,875
VACUUM CLEANER CONSTRUCTION

Eberhard Rother, Wuppertal, and Miroslav Beranek, Donberg, both of Germany, assignors to Vorwerk & Co. Elektrowerke KG, Wuppertal, Germany

Filed Oct. 3, 1973, Ser. No. 403,189
Claims priority, application Germany, Oct. 26, 1972, 2252493
Int. Cl.[2] A47L *9/04*
U.S. Cl. 15—387 **8 Claims**



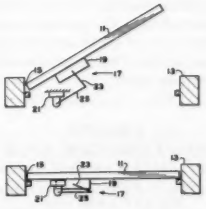
1. In a vacuum cleaner, a nozzle unit comprising a housing having an inlet opening for particle-carrying air, and an outlet communicating with the suction source of the vacuum cleaner; a brush disc located in said housing and having bristles extending outwardly through said opening, and a plurality of circumferentially spaced inclined vanes extending radially of the disc periphery and arranged to be impinged by air flowing from said inlet opening to said outlet so that such air drives said disc in rotation; mounting means mounting said disc for rotation about an axis which extends substantially normal to the plane of said opening, and for displacement inwardly of said opening along said axis; biasing means yieldably resisting said displacement; and sealing means sealing said mounting means and biasing means against contact with the particle-carrying air flowing through said housing.

8. A nozzle as defined in claim **1**, said mounting means comprising a tubular guide mounted in said housing and having an open end facing said opening, a journal pin slidably received in said guide and having a free end portion extending from said open end, said biasing means urging said pin outwardly of said guide, a bearing ball intermediate and in engagement with an inwardly directed surface of said disc and an axial end face of said end portion, and means mounting said disc on said tubular guide slidable axially of the same against the action of said biasing means.

3,909,876
DOOR CLOSER ASSEMBLY PREVENTING MISALIGNMENT OF CLOSER AND ARM

Richard L. Zunkel, Marshville, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 7, 1974, Ser. No. 512,375
Int. Cl.[2] E05F *1/00*
U.S. Cl. 16—71 **6 Claims**



1. A door closer assembly for door elements including a door and a frame, said door closer assembly comprising:

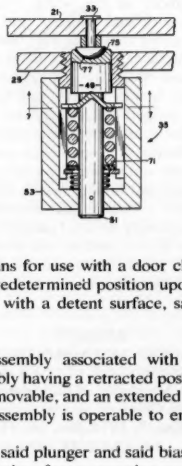
a. a door closer attached to one of said door and frame, said door closer including a rotatable drive member;
b. a closing arm having a first end pivotally mounted to the other of said door and frame and having a second end adapted to engage said drive member for rotation therewith, said closing arm and said drive member defining a proper orientation;
c. one of said rotatable drive member and closing arm including a drive portion and the other of said rotatable drive member and closing arm defining an opening adapted to engagingly receive said drive portion for movement therewith;
d. said drive portion having a plurality N of sides and a plurality N of external corners; and
e. said opening comprising a plurality greater than N of internal corners, each of said internal corners being adapted to receive one of said external corners of said drive portion, at least one of said corners being configured to interfere when said closing arm and said rotatable drive member are in an orientation other than said proper orientation.

3,909,877

DETENT DOOR HOLDER

Charles B. Christy, Charlotte, and Roger D. Long, Marshville, both of N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 17, 1975, Ser. No. 541,833
Int. Cl.[2] E05F *5/06*
U.S. Cl. 16—85 **13 Claims**



1. A detent means for use with a door closer assembly to hold a door in a predetermined position upon engagement of said detent means with a detent surface, said detent means comprising:
a. a body;
b. a plunger assembly associated with said body, said plunger assembly having a retracted position in which the door is freely movable, and an extended position in which said plunger assembly is operable to engage said detent surface;
c. means biasing said plunger and said biasing means exerting a first biasing force opposing movement of said plunger assembly from said extended, operable position toward said retracted position; and
d. said biasing means exerting a second biasing force opposing movement of said plunger assembly from said retracted position toward said extended, operable position, said first biasing force being substantially greater than said second biasing force.

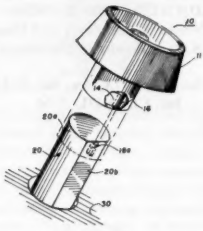
3,909,878

SHAFT ENGAGING KNOB

Ronald E. Natinsky, 13135 Kerr Trail, Dallas, Tex. 75234

Filed Nov. 5, 1973, Ser. No. 412,655
Int. Cl.[2] A47B *95/02*
U.S. Cl. 16—121 **1 Claim**

1. A knob adapted for non-rotatable and interchangeable engagement with a first rotatably mounted shaft having a D-shaped end cross-section defined by a circular portion terminating in a flat chordal segment as well as a second rotatably mounted shaft having an end cross-section defined by two semicircular portions separated by a diametrically extending notch, said knob comprising:
a. a circumferentially extending wall defining a centrally disposed longitudinally extending cavity for respectively receiving said first and second rotatably mounted shafts, said circumferentially extending wall having an end cross-section defined by an entirely circular shaped surface portion solely interrupted by a projection of said wall portion extending into said cavity, said projection having a flat face thereof; and
b. a circular spring having its major portion adjacent to, and conforming to the shape of, the circular shaped surface



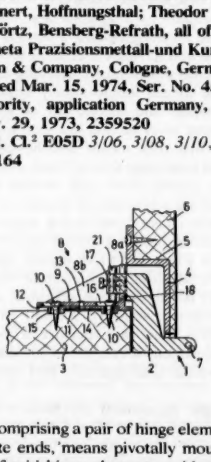
portion of said circumferentially extending wall, said spring further having end portions terminating adjacent said projection;
c. said first rotatably mounted shaft, when received within said cavity, having its circular portion resiliently engaged by said spring along its entire circumference, the flat chordal segment being engaged by the flat face of said projection;
d. said second rotatably mounted shaft, when received within said cavity, having its two semicircular portions entirely surrounded by the circular shaped surface portion of said circumferentially extending wall and resiliently engaged by said spring along the entire circumference of said semicircular portions with the projection extending into said notch.

3,909,879

HINGES FOR ABUTTING DOOR SASHES

Hellmuth Grünert, Hoffnungsthal; Theodor Vitt, Porz-Eil, and Johannes Görtz, Bensberg-Refrath, all of Germany, assignors to Prameta Prazisionsmettall-und Kunststofferzeugnisse G. Baumann & Company, Cologne, Germany

Filed Mar. 15, 1974, Ser. No. 451,560
Claims priority, application Germany, Mar. 24, 1973, 2314691; Nov. 29, 1973, 2359520
Int. Cl.[2] E05D *3/06, 3/08, 3/10, 15/52*
U.S. Cl. 16—164 **10 Claims**



1. A hinge comprising a pair of hinge elements, an extension having opposite ends, means pivotally mounting one of said ends to one of said hinge elements, said pivotally mounting means defines a pivot axis, the other of said ends being of a

T-shaped configuration defined by a neck and a crossbar, a slot formed in a wall of the other of said hinge elements, said neck being received in said slot, means for locking said extension to said other hinge element, means for adjusting the position of said neck within said slot in a direction generally normal to said pivot axis, and said adjusting means being a screw threaded in said crossbar with the axis thereof being disposed generally normal to the pivot axis of said pivotally mounting means.

3,909,880

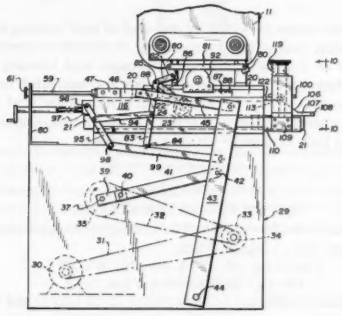
MOLDING APPARATUS

Harry H. Holly, Olympia Fields, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Continuation-in-part of Ser. No. 244,027, April 14, 1972. This application Oct. 27, 1972, Ser. No. 301,625

Int. Cl.[2] A22C *7/00*

U.S. Cl. 17—32 **2 Claims**



1. Molding apparatus, comprising: a cabinet; a movable mold on said cabinet having a shaping opening for forming a shaped article from moldable material; supply means for providing said moldable material to said shaping opening, said supply means having a supply passage in said cabinet; means for moving said mold over a fixed path including a first range of movement between a filling position for said opening within said cabinet communicating with said passage and a discharge position for said shaping opening located externally of said supply passage; article removing means at said discharge position for removing said shaped article from said shaping opening; means operatively interconnecting said mold and said removing means for conjoint movement of said removing means with said mold generally parallel to said path when said mold opening is adjacent to said discharge position; means for terminating said conjoint movement thereafter; and means located at said discharge position for moving said removing means generally transversely to said path into and out of said shaping opening during said conjoint movement for said removing of said article from said shaping opening, said conjoint movement being over a second range of movement that is only a minor fraction of said first range of movement of said mold, said means for moving said removing means out of said shaping opening comprising a cam means operatively engaging said removing means during said second range of movement.

3,909,881

APPARATUS FOR MAKING A HOLLOW HAMBURGER

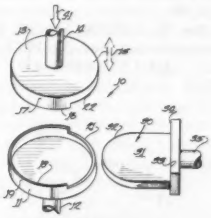
Carlton O. Anderson, 4715 Nebraska Ave., Omaha, Nebr. 68104

Filed Jan. 9, 1974, Ser. No. 432,073

Int. Cl. A22c *7/00*

U.S. Cl. 17—32 **1 Claim**

1. Apparatus for making hamburgers having hollow center portions and the like comprising a mold having substantially identical first and second mating half portions, said first half portion having a circular horizontal base with surrounding vertical cylindrical side walls defining an open topped chamber therebetween, said first half portion fixedly secured by a rod to prevent movement thereof, said second half portion being of a substantially identical size and shape and configuration to said first half portion and including a horizontal circular base portion with depending vertical cylindrical side walls thereabout defining an open bottomed chamber therebetween adapted to be disposed in confronting relationship with the chamber of said first portion, hollow tube means supporting said second portion for reciprocal vertical movement into and out of engagement with said first portion, said hollow supporting member providing for communication with said compartments when said molds are in their closed positions onto each other, a circumferal recess defined in each of said first and second portions sidewalls, said recesses disposed in confronting relationship and forming a circumferal slot when said second half portion is in engagement with said first half portion, a pocket defining mandrel mounted for reciprocal movement in a plane normal to the axis of said first and second half portions, said mandrel comprising a flat platform member having an arcuate leading edge and a flat back edge, a support member affixed to said back edge for supporting said platform member, a support control rod affixed to said support member for effecting reciprocal movement of said mandrel relative to said mold, said platform being of a size and configuration adapted to be received freely through said circumferal slot to form a pocket in meat products compressed into said mold chamber, and a tin foil pocket defining member disposed over said platform in a manner to be forcably inserted into said meat product when said platform is inserted through said slot into said chamber, said tin foil pocket remaining in said meat product when said platform is withdrawn from said meat product to thus define a pocket in said meat product for later stuffing of condiments and the like after said meat product has been cooked, said tin foil further serving to materially shorten the cooking time of said meat product as it conducts heat so that the meat is cooked both from the inside as well as from the outside.



3,909,882

COHERENT STICK OF SHIRRED TUBING

Louis L. Winokur, Evanston, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 35,443, May 7, 1970, Pat. No. 3,695,901. This application Oct. 2, 1972 Ser. No. 293,769

Int. Cl.[2] A22C *13/00*

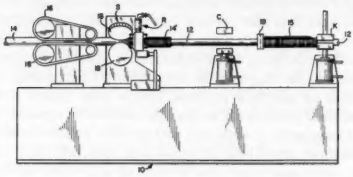
U.S. Cl. 17—42 **7 Claims**

1. An apparatus for producing a coherent, self-sustaining stock of shirred and compressed flexible tubing, which apparatus comprises

a mandrel and means for shirring a length of flexible tubing onto said mandrel;

at least one narrow blade longitudinally disposed about the mandrel in spaced relationship therewith and in adjacent relationship with the shirring means to engage a narrow

portion of the outer surface of a shirred tubing and restrain the longitudinal advance thereof;



and means for controllably positioning the blade about the mandrel.

3,909,883

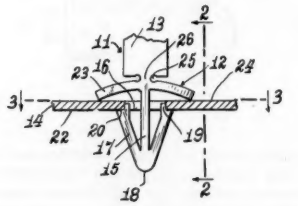
LOCKING BASE FOR PLASTIC COMPONENTS

James F. Fegen, Chicago, Ill., assignor to Richco Plastic Company, Chicago, Ill.

Division of Ser. No. 229,800, Feb. 28, 1972, Pat. No. 3,777,052. This application Nov. 30, 1973, Ser. No. 420,704

Int. Cl.[2] A44B *21/00*

U.S. Cl. 24—73 P **7 Claims**



1. In a support integral with a component and a panel having a circular aperture therein for mounting the component on one face of the panel, said support comprising a resilient substantially elongated base connected to the component and having opposed free ends arched in the direction of the panel, a stem extending centrally from the base and through the aperture, a pair of yieldable wings integral with and extending from the free end of said stem toward said panel, said wings having diverging free ends one aligned with each of said base ends and normally spread beyond the perimeter of said circular aperture, an extension on the free end of each wing adapted to enter the aperture when the support is mounted, said extensions and said wing ends being contoured to bear against the perimeter of said aperture and said panel to prevent spreading of said wings and to center said support in the aperture when the support is mounted on the panel.

3,909,884

WEDGE LOCK CABLE CLAMP

Ethan Weckesser, Chicago, Ill., assignor to Weckesser Company, Inc., Chicago, Ill.

Filed Feb. 10, 1975, Ser. No. 548,535

Int. Cl.[2] A44B *21/00*

U.S. Cl. 24—73 SA **6 Claims**

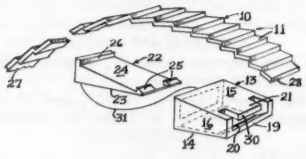
1. A clamp for securing together a bundle of wires and the like comprising in combination

a. an elongated binding strap having each of its flat faces provided with interlocking ratchet teeth extending transversely to the length of the strap,

b. a housing providing a passage extending therethrough into which opposite ends of said strap are projected, with their ratchet teeth in mating relation as said strap is looped about a bundle to be secured thereby,

c. catch means within said housing and partially interrupting the passage formed therethrough and engaging certain of the ratchet teeth of said strap when the latter is projected through said housing,

d. latch means insertable into said housing and upon said strap to lock said ratchet teeth of each opposite end of said strap together and upon said catch means within said passage, and



e. yieldable means provided by one wall of said housing above said catch means and cooperating therewith to restrict a portion of the passage formed through said housing to a height less than that of the strap ends and said latch means, and movable away from said catch means by said latch means when the latter is inserted into said housing upon said strap to lock said strap within said passage.

3,909,885

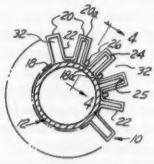
CONDUIT GARTER SPACER

George M. Sinko, Royal Oak, Mich., assignor to Underground Products, Inc., Livonia, Mich.

Filed May 28, 1974, Ser. No. 473,375

Int. Cl.[2] B65D *63/00*; **F16L** *9/18*

U.S. Cl. 24—16 PB **6 Claims**



1. A conduit garter spacer comprising a web of material formed with a plurality of zigzag folds defining a pair of substantially parallel imaginary surfaces, each of said surfaces being defined by the loci of the vertices of said folds, wherein said zigzag folds are substantially at right angles, and successive folds form in side elevation a sinuous design of consecutive merlon-like projections and crenel-like indentations of substantially constant period, and means at an end of said web for resiliently gripping the edges of the other end of said web, with at least one merlon-like portion at said other end projecting within a crenel-like portion at said first end.

3,909,886

DEVICE FOR TRACTION-PROOF AND PRESSURE RESPECTIVELY MOISTURE-TIGHT SEALING OF A CABLE END

Kurt Hocke, Virgilstrasse 9, 8000 Munchen 80, Germany

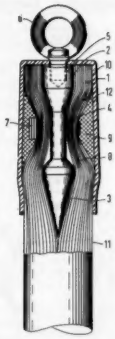
Filed Dec. 17, 1973, Ser. No. 414,619

Int. Cl.[2] F16G *11/05*, *11/02*

U.S. Cl. 24—122.6 **6 Claims**

1. A pulling attachment for a cable end of a communications cable wherein said attachment is introduced into the end of a cable and coaxially disposed with respect to the sheath thereof, comprising a mandrel possessing front and rear sections separated by at least one cylindrical middle section of

reduced diameter with respect to said front and rear sections, said front section comprising a tapered conical tip expanding to a diameter larger than that of said middle section, and said rear section comprising a truncated cone extending from the



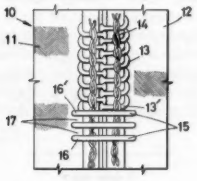
reduced diameter of said middle section to a cylindrical rearmost portion, said attachment further comprising at least one tensioning means arranged around said at least one middle section of reduced diameter which presses the wires of the cable against the mandrel at an area of reduced diameter.

3,909,887

BOTTOM END STOP FOR SLIDE FASTENERS

Hiroshi Yoshida, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 20, 1974, Ser. No. 507,755
Claims priority, application Japan, Oct. 9, 1973, 48-117829
Int. Cl.² A44B *19/00*
U.S. Cl. 24—205.11 R **3 Claims**



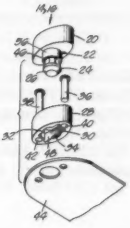
1. In a slide fastener comprising a pair of oppositely disposed stringer tapes carrying along their respective inner longitudinal edges rows of interlocking fastener elements, a slider reciprocally movable along said edges to take the rows of fastener elements into and out of interlocking engagement with one another, and a bottom end stop secured to the lower portion of the stringer tapes for limiting the movement of the slider at the bottom end of the fastener, the improvement wherein said bottom end stop comprises a plurality of transversely elongated staple-like stop members extended across the beaded edges of the stringer tapes and connected thereto and thereby secured in positions on the lower portion of the stringer tapes, said stop members being spaced apart one from another substantially in parallel and longitudinally of the fastener to provide a gap between adjacent stop members, said gap being wide enough to admit therein a sewing needle.

3,909,888

TURN-BUTTON FASTENER

Jules H. Funston; Elmer O. Grumet; Henry G. Mast, and Charles J. Scott, all of Denver, Colo., assignors to Samsonite Corporation, Denver, Colo.

Filed May 20, 1974, Ser. No. 471,479
Int. Cl.² A44B *17/00, 1/32*
U.S. Cl. 241—221 R **1 Claim**



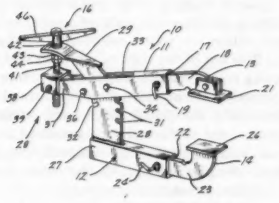
1. A turn-button fastener, comprising in combination:
an oblong knob with an integral shaft extending normally therefrom, said shaft having a first extent immediately adjacent the knob of circular cross-section, a zone of restricted cross-section immediately adjacent said first extent having four flat surfaces arranged at 90° intervals thereabout, the intersecting corners formed of the four flat surfaces on said shaft being radiused, an enlarged collar on the outer end portion of said shaft adjacent to said zone of restricted diameter, and a tapered terminus; and
a base member constructed of an elastic material having an opening passing therethrough, the wall defining said opening being resilient and including opposing parallel flat wall surfaces of a spacing substantially equal to the cross-section dimension between opposite shaft flat surfaces, said base member opening walls further having arcuate recesses adjacent said flat surfaces into which the enlarged collar of said shaft is fittingly received and secured against lateral displacement thereby.

3,909,889

CLAMP

Christopher P. Emerson, 405 E. Main, Lamoni, Iowa 50140

Filed Apr. 26, 1974, Ser. No. 464,567
Int. Cl.² A44B *21/00*; B25B *1/04*
U.S. Cl. 24—248 A **9 Claims**



1. A clamp comprising:
a first elongated arm member having an object engaging end and a control end;
a second arm member having an object engaging end and a control end;
means for pivotally connecting said first and second arms intermediate the ends thereof; and
means for varying the distance between the pivotal connection and the object engaging ends of said first and second arm members, said distance varying means comprising two spaced pivotal rods on said first arm member and at

least one opening in said second arm member for receiving each of said pivotal rods, and wherein a plurality of slot shaped openings are disposed on opposite edges of said second arm member, the slot shaped opening on one edge being adapted to pivotally receive one of said pivotal rods and the slot shaped openings on the other edge of said second arm member being adapted to pivotally receive the other of said pivotal rods.

3,909,890

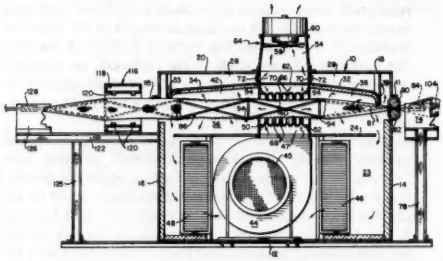
METHOD FOR HEAT-TREATING KNITTED FABRIC IN TUBULAR DISTENDED FORM

Robert Frezza, Carle Place, N.Y., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Division of Ser. No. 220,277, Jan. 24, 1972, Pat. No. 3,762,003. This application May 9, 1973, Ser. No. 358,505

Int. Cl.² D06C *5/00*

U.S. Cl. 26—56 **8 Claims**



1. A method for treating tubular knitted fabric; the steps which comprise circumferentially distending the fabric to be treated into internally open tubular form; advancing said fabric through a succession of treatment zones, including a pretreating zone, a treating zone and a post-treating zone; directing treating air into the tube of said fabric about its circumference within the said treating zone and causing the treating air to flow out of the tube of fabric in said pretreating and post-treating zones; maintaining the fabric free of distending contact pressures during advancement through said treating zone; distending the fabric within the pretreating and post-treating zone by restricted area pressure contact with said fabric at longitudinally and circumferentially spaced contact points, whereby marking of the internal surfaces of said treated fabric is substantially avoided.

8. A method for treating tubular knitted fabric; the steps which comprise circumferentially distending the fabric to be treated into internally open tubular form; advancing said fabric through a succession of treating zones; directing treating air into the tube of said fabric about its circumference in one of said treating zones while maintaining the fabric free of distending contact pressures in said one zone; causing the treating air to flow out of said fabric tube in at least one other of said treating zones while distending the fabric prior to and following said one zone by restricted area pressure contact at longitudinally and circumferentially spaced contact points whereby marking of the internal surfaces of said treated fabric is substantially avoided.

3,909,891

NEEDLING APPARATUS

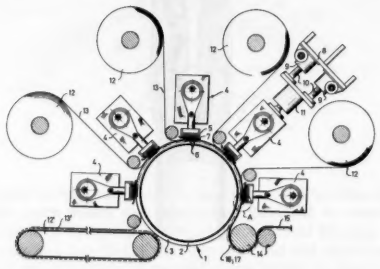
Richard Dilo, Eberbach (Neckar), Germany, assignor to Oskar Dilo KG, Eberbach (Neckar), Germany

Division of Ser. No. 323,257, Jan. 12, 1973, abandoned. This application July 8, 1974, Ser. No. 487,245

Claims priority, application Germany, Jan. 18, 1972, 2202127

Int. Cl.² D04H *18/00*

U.S. Cl. 28—4 R **5 Claims**



1. An apparatus for making a non-woven textile web having felt-like surface patterns, comprising

1. a continuously rotating elongated drum having an axis and defining a multiplicity of adjacent circumferential grooves.
2. a plurality of needling units angularly spaced about correspondingly spaced arcuate circumferential sectors of the drum, each needling unit carrying a plurality of needles arranged to impart a surface pattern,
3. means for reciprocating each of the needling units at predetermined intervals in a radial direction in a plane perpendicular to the drum axis for moving the needles into and out of the circumferential grooves of the drum in the corresponding arcuate sector thereof, and
4. a like plurality of means arranged to deliver a sequence of non-woven textile layers tangentially to the continuously rotating drum and to respective ones of the arcuate sectors thereof, each delivery means being arranged ahead of a corresponding one of the drum, whereby the needling units sequentially needle the layers and form the web with felt-like surface patterns of superposed ones of said layers during the continuous rotation of the drum as the needles are moved through the layers into and out of the circumferential grooves of the drum supporting the layers.

3,909,892

APPARATUS FOR PRODUCING A COILED THREAD PACKAGE

Renato Crotti, 71, Corso Canalgrande, Modena, Italy (41100)

Filed Apr. 10, 1974, Ser. No. 459,644

Claims priority, application Italy, Apr. 12, 1973, 12573/73

Int. Cl.² B65H *51/02, 55/00*

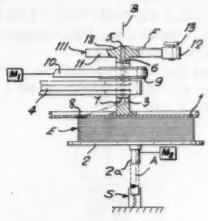
U.S. Cl. 28—21 **8 Claims**

1. An apparatus for producing a coiled thread package constructed of a continuous length of thread disposed in substantially annular layers forming a coil, each layer being constructed of a series of loops which progress along the annular layer of the coil, said apparatus comprising:

a. a receiving plate having a vertical axis;

b. a thread depositing disc arranged above said receiving plate and having a vertical axis, said axis of said depositing disc being arranged eccentrically with respect to the axis of the receiving plate, said receiving plate and said depositing disc being capable of relative movement toward and away from each other in vertical direction;

c. means for yieldingly urging the said receiving plate and the said depositing disc into relative movement towards each other;
d. means for rotating the said depositing disc around its axis;
e. further means for causing a relative movement between the axis of the depositing disc and the receiving plate;
f. a through bore on said depositing disc providing a passage for the thread to be deposited on the receiving plate;
g. a feeding device for the thread to be deposited on the receiving plate, said feeding device comprising:
1. a track-forming member arranged above the depositing disc and integral in rotation with same, said track-forming member presenting an outer annular track which is coaxial to the vertical axis of the depositing disc;



2. thread guiding means integral in rotation with the said depositing disc;
3. a freely rotatable roller supported by means which are stationary with respect to the track-forming member, said roller being caused to elastically bear with its outer revolving peripheral surface against the annular track of the track-forming member,

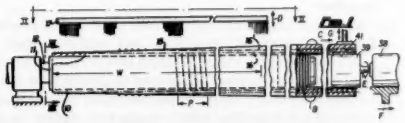
whereby the thread coming from a suitable supply passes in the contact zone between the said roller and the said track, through the said thread guiding means, and through the bore in the depositing disc, to be finally deposited onto the receiving plate upon rotation of the said depositing disc and relative movement between the axis of the depositing disc and the receiving plate.

3,909,893

PROCESS FOR MAKING TUBULAR NEEDLEFELTED MATERIAL

John Clarke Wilde, P.O. Box 14, Bury, England (BL9 6HD)

Filed July 15, 1974, Ser. No. 488,559
Int. Cl.[2] D04H *18/00*
U.S. Cl. 28—72.2 R **12 Claims**



1. A process for manufacturing an improved tubular needlefelted material comprising:
a. forming a continuous web of fibres of predetermined width;
b. feeding the web as a helix to create a tube with adjacent turns of the helix overlapping by a major part of said predetermined width;
c. causing a plurality of strengthening strands to wrap said tube helically as the web is fed, said strands occupying a width which is less than said predetermined width of said web;
d. needlefelting said tube and strands and
e. progressively advancing the needlefelted tube in the direction of the axis of the tube,

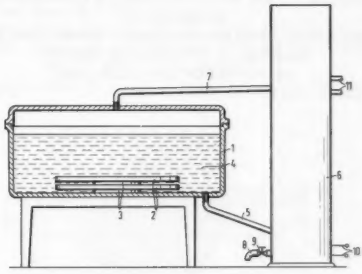
whereby there is formed a needlefelted tube with helically wound strengthening strands located within the wall thickness of the tube.

3,909,894

METHOD OF END-CONTACTING ELECTRICAL CAPACITORS

Ulrich Muller, Regensburg, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 4, 1974, Ser. No. 439,570
Claims priority, application Germany, Feb. 7, 1973, 2305999
Int. Cl.[2] H01G *7/00*
U.S. Cl. 29—25.42 **7 Claims**



1. A method of end-contacting an electrical capacitor having electrodes, dielectric films and wax residues on the electrodes, dielectric films and wax residues on the electrodes wherein the electrodes of opposing polarities extend respectively to different ends of the capacitor each electrode having one of its edges adjacent the capacitor end to which it extends, said capacitor comprising a plurality of wound foils comprising the steps of
winding the capacitor foils,
putting the wound foils in an extraction vessel containing a wax solvent to extract wax from the edges of the electrodes and expose the same,
removing the foil from the extraction vessel,
and electrically contacting the exposed electrode edges of the finished capacitor.

3,909,895

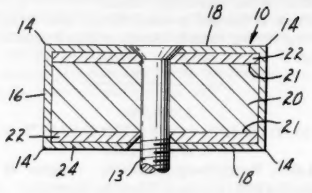
COATED LAMINATED CARBIDE CUTTING TOOL

Gerald R. Abrahamson, White Bear Lake, and Charles E. Mereness, Arden Hills, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 13, 1974, Ser. No. 450,578
Int. Cl.[2] B26D *1/00*; B21K *21/00*
U.S. Cl. 29—95 A **8 Claims**

1. A laminated, crater-resisting carbide cutting tool insert comprising:
a laminated cemented carbide composite substrate having a cemented metal carbide core containing a majority of tungsten carbide bound with an iron group binder and a thin layer of crater-resistant cemented metal carbide differing in chemical composition from the core on the rake face of said substrate and forming the cutting edge of the substrate, said crater-resistant material comprising a major portion of tungsten carbide and at least one additional carbide of a metal chosen from Groups IV*b*

and V*b* of the periodic table, and



a hard surface coating surfacing the rake face and flanks of said substrate, said hard surface coating being no more than 0.0254 millimeter in thickness.

3,909,896

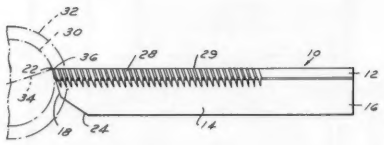
CUTTING TOOL FOR PARTING OR GROOVING A WORKPIECE

William Krozal, 20498 Beaufait, Harper Woods, Mich. 48225

Filed May 2, 1974, Ser. No. 466,201

Int. Cl.[2] B26D *1/00;* **B23B** *3/00*

U.S. Cl. 29—95 R **5 Claims**



1. A cutting tool for parting or grooving a workpiece including a body having an attacking surface, side surfaces extending therefrom, and a forward surface, a cutting edge defined by the juncture of the attacking surface and the forward surface, said body having at least one groove in each side surface extending from the attacking surface at a point adjacent the cutting edge, said groove having a width and depth of about at least 0.005 inch and being spaced from the cutting edge no more than about 0.250 inch.

3,909,897

METHOD FOR MAKING A ROTARY PISTON INTERNAL COMBUSTION ENGINE

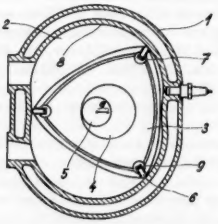
Jiri Seidl, Uppsala, Sweden, assignor to AB Volvo Penta, Goteborg, Sweden

Division of Ser. No. 255,573, May 22, 1972, abandoned. This application Oct. 31, 1973, Ser. No. 411,435

Claims priority, application Sweden, June 7, 1971, 7310/71

Int. Cl.[2] B23P *15/00*

U.S. Cl. 29—156.4 R **2 Claims**



1. A method of making a rotary piston internal combustion engine comprising a housing and a cylinder in said housing, a piston planetarily moving and rotating within said cylinder and having a plurality of apex portions extending parallel to the axis of the piston and each having a sealing strip with a sliding surface for engagement with a cylinder wall of said housing, said method comprising taking a sealing strip with a worn sliding surface from a used rotary piston engine having an n-lobed epitrochoidal cylinder wall in which an $n + 1$ apexed used piston is mounted for rotational and planetary movement, copying the curvature of said worn sliding surface onto a pattern-producing tool and producing a pattern of a cylinder wall curvature by moving said tool in a rotational path identical to that of said used piston, and thereafter copying said pattern to produce a new cylinder wall curvature which is the envelope of said worn sliding surface.

3,909,898

METHOD AND APPARATUS FOR MANUFACTURING A HELICALLY FINNED HEAT EXCHANGER

Robert E. Hicks, Ellicott City, Md., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 4, 1974, Ser. No. 529,445

Int. Cl.[2] B21D *53/02;* **B23P** *15/26*

U.S. Cl. 29—157.3 AH **8 Claims**

1. Method of manufacturing a continuous spine fin heat exchanger tube including a spine fin material supported on a base tube member which comprises:

helically winding said spine fin material in intimate contact with adjacent wraps and the outer wall of said tube;

securing a preselected portion of said spine fin material at spaced intervals on said spine fin heat exchanger so as to prevent movement thereof relative to said base tube member;

severing said heat exchanger in said preselected portion to form predetermined lengths of said heat exchanger with said preselected portions forming end portions effectively held against movement relative to said base tube member so that the other portion of said helically wound spine fin material intermediate said preselected portion is maintained in its initial helically wound position.

5. An apparatus for manufacturing a continuous spine fin heat exchanger tube including a spine fin material supported on a base tube member which comprises:

means advancing said base tube member at a preselected rate of speed;

means helically winding said spine fin material in intimate contact with adjacent wraps and the outer wall of said advancing tube to form said spine fin heat exchanger;

means securing a preselected portion of said spine fin material at spaced intervals along the advancing spine fin heat exchanger so as to prevent movement thereof relative to said base tube member;

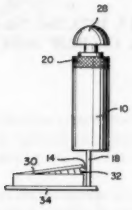
means severing said advancing heat exchanger in said preselected portion to form predetermined lengths of said heat exchanger with said preselected portion forming end portions effectively held against movement relative to said base tube member so that the other portion of said helically wound spine fin material intermediate said preselected portion is maintained in its initial helically wound position.

3,909,899

EXTRACTION TOOL FOR INTEGRATED CIRCUITS

Wilbur W. Witt, Apts. 11-B, The Racquet Club Apt., Zanesville, Ohio 43701

Filed Dec. 11, 1974, Ser. No. 531,756
Int. Cl.[2] B25B 27/14
U.S. Cl. 29—203 H 8 Claims



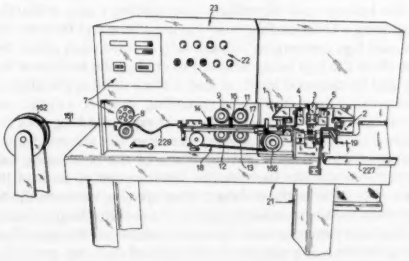
1. A manually held extraction tool for removing an integrated circuit package from a socket to which it is attached, said integrated circuit having a plurality of electrical leads extending therefrom and being connected to said socket, said extraction tool comprising a barrel, a plunger movable within said barrel, said barrel serving to be manually gripped and held by one hand, a hook carried by said barrel, adjustable stop means on said plunger engageable with said barrel to control the amount of upward lift of said plunger, leg members attached to said barrel for resting said tool on said socket, said hook being inserted between the bottom of said integrated circuit and said socket to lift said integrated circuit from said socket, said lift amount being controlled by said stop member.

3,909,900

APPARATUS FOR PRODUCING ELECTRICAL CONDUCTORS

Ragnar Gudmestad, West Allis, Wis., assignor to Artos Engineering Company, New Berlin, Wis.

Filed May 22, 1974, Ser. No. 472,491
Int. Cl.[2] H01R 43/04
U.S. Cl. 29—203 DT 16 Claims



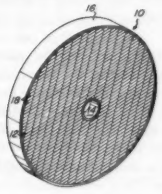
1. An apparatus for producing electrical conductors from insulated wire stock, comprising a frame; a pair of wire clamping assemblies operatively mounted on said frame for relative back and forth adjustment between positions of minimum, intermediate and maximum spacing from each other; a wire and insulation cutting assembly and a pair of terminal crimping assemblies at opposite sides thereof operatively mounted on said frame between said wire clamping assemblies; three stage actuating means operable to adjust said clamping assemblies to said minimum, intermediate and maximum spacings from each other; and actuating means for said cutting and crimping assemblies operatively interrelated with said actuating means for said clamping assemblies, whereby relatively adjacent end portions of a wire severed by said cutting assembly are stripped and pulled away from the latter beyond said crimping assemblies and whereby said stripped wire ends are subsequently pushed back into said crimping assemblies, respectively, preparatory to the attachment of terminals to said stripped wire ends by said crimping assemblies.

3,909,901

METHOD OF FABRICATING A HEAT EXCHANGER CORE

Daniel J. Clark, Bay City, Mich., assignor to The Stalker Corporation, Essexville, Mich.

Division of Ser. No. 346,028, March 29, 1973, Pat. No. 3,830,286. This application May 16, 1974, Ser. No. 470,372
Int. Cl. B21d 53/02; B23p 15/26
U.S. Cl. 29—157.3 D 16 Claims



1. A method of fabricating a rotary heat exchanger core comprising:

a. forming a plurality of relatively thin flat strips each into a stepped configuration including a plurality of relatively broad portions extending substantially parallel to each other and joined by a plurality of relatively narrow sections extending in substantially parallel relationship to each other and angularly to said broad portions,

b. stacking said strips in offset relationship to each other with adjacent, relatively narrow sections of adjacent strips spaced from each other a distance less than the width of said relatively broad portions and with areas of contact between adjacent relatively broad portions of adjacent strips,

c. joining said strips to each other at said contacting areas between adjacent of said relatively broad portions, and

d. forming an opening through said stack adjacent the center thereof in a direction parallel to the width of said strips of said stack.

3. A method of fabricating a rotary heat exchanger core comprising:

a. forming a plurality of relatively thin flat strips each into a stepped configuration including a plurality of relatively broad portions extending substantially parallel to each other and joined by a plurality of relatively narrow sections extending in substantially parallel relationship to each other and angularly to said broad portions,

b. forming openings in the ends of each of said strips with said openings being spaced inwardly from the ends of said strips at progressively different intervals,

c. stacking said strips in offset relationship to each other with adjacent, relatively narrow sections of adjacent strips spaced from each other a distance less than the width of said relatively broad portions and with areas of contact between adjacent relatively broad portions of adjacent strips, and

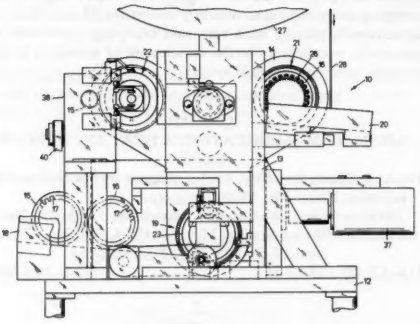
d. joining said strips to each other at said contacting areas between adjacent of said relatively broad portions.

3,909,902

CELL INSERTING MACHINE

Robert W. Peters, 9036 N. 75th St., Milwaukee, Wis. 53233

Filed May 30, 1974, Ser. No. 474,393
Int. Cl.[2] H02K *15/10*
U.S. Cl. 29—205 E **11 Claims**



1. In a cell inserting machine for automatically inserting cells into the slots of a stator, the machine including:

a turret vertically mounted for rotary motion on a base, the turret being indexed to move a stator from a loading station to a cell inserting station to an unloading station, the improvement comprising:

means for feeding a strip of cell material into said inserting station,

means for holding the end of the strip at the inserting station,

means for cutting the end of the strip to a predetermined length,

means for forming the cut strip to the shape of a stator slot, a plow for guiding the cell into the slot of said stator,

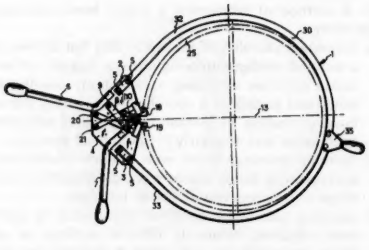
and means for carrying the cell through said plow into a slot in the stator.

3,909,903

PLIERS FOR INTERNAL COMBUSTION ENGINE PISTON PACKING-RING

Jean-Claude Bouquet, Pantin, France, assignor to Societe d'Etudes de Machines Thermiques, St. Denis, France

Filed Oct. 3, 1974, Ser. No. 511,577
Claims priority, application France, Nov. 7, 1973, 73.39571
Int. Cl.[2] B23P *15/10*
U.S. Cl. 29—224 **5 Claims**



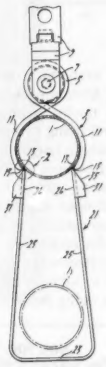
1. Piston packing-ring pliers having handles for installing packing-rings into the grooves of pistons of large diameters, of the kind comprising a substantially circular arcuate portion inside of which said packing-ring is placed, a pair of jaws for spreading apart packing-ring ends and a toggle system connected to at least one of the handles of said pliers and to said spreading jaws, respectively, wherein the improvement consists in the provision of bearing abutment means for continuously backing approximately the half-circumference of said packing-ring on the side substantially opposite to the ends of said packing-ring in the spread apart positions thereof, and means for guiding said spreading jaws during their displacements along paths of travel extending substantially radially with respect to the substantially circular apparent contour of said packing-ring.

3,909,904

REMOVAL TOOL FOR SPRING TYPE PIPE HANGER

Larry E. Strunk, Jackson, Mich., assignor to Tenneco Inc., Racine, Wis.

Filed Oct. 17, 1973, Ser. No. 407,206
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—229 **2 Claims**



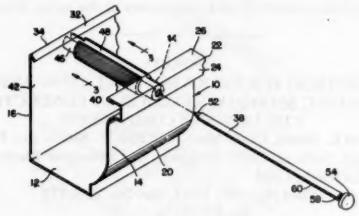
1. A tool for spreading the jaws of a snap-in spring clip or the like having a pair of resilient jaws holding a pipe or the like comprising a U-shaped member having a base and flexible side legs, said legs converging substantially toward each other, the tip ends of the legs being adapted to engage the surface of the pipe and be cammed apart on said surface upon application of force to said base and upon spreading apart to engage and spread apart said jaws to release said pipe, the length of the member being substantially greater than the cammed apart spacing of the tip ends and the width of the base being substantially wider than the distance between the tip ends of the legs and as wide as the cammed apart spacing between the tip ends whereby the member is adapted to receive the pipe inside the member between said legs upon release of the pipe from said jaws, retaining means on the ends of said legs providing troughs having bottom surfaces receiving the ends of said jaws and side surfaces to restrain them from slipping sideways off the tool, said retaining means comprising sides on the legs folded to extend at substantially right angles to the plane of the legs.

3,909,905

GUTTER INSTALLATION TOOLS

Louis J. Giordano, 4 Highland Court, Linwood, N.J. 08221

Filed June 26, 1974, Ser. No. 483,385
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—271 15 Claims



1. In a gutter installation system for hanging gutters having a front panel and a spaced rear panel by driving a spike through the panels and into a construction member, the combination of

A. spacer means to maintain the spacing between the front and rear panels as the spike is driven,

1. said spacer means including a body portion,

2. said body portion being provided with a longitudinally extending groove to receive the driven spike,

a. said groove defining a spike receiving area and an open area,

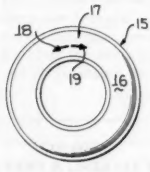
b. said open area being greater in width than the cross sectional dimension of the spike, whereby the spacer means can be removed from a driven spike.

3,909,906

METHOD OF MAINTAINING PROPER ROTATIONAL CHARACTERISTICS OF A RADIAL TIRE

Kenneth T. MacMillan, 4992 Wesleyan Woods Drive, Macon, Ga. 31204

Filed Mar. 8, 1974, Ser. No. 449,533
Int. Cl.[2] B23Q *17/00*
U.S. Cl. 29—407 14 Claims



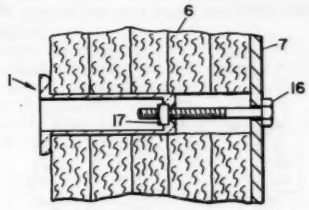
1. A method of maintaining proper rotational characteristics of a radial tire comprising the steps of providing a radial tire having upon at least one side wall thereof indicia means capable of indicating both potential clockwise and counterclockwise rotation of the tire as viewed from the side of the vehicle upon which the tire is adapted to be mounted, mounting the tire upon a vehicle, said mounting step includes an alteration of said indicia means such that the indicia means indicates only the actual direction of rotation of the tire as viewed from the side of the vehicle upon which the tire is mounted whereby the initial direction of rotation of the tire will remain known for the lifetime thereof irrespective of multiple mountings and/or demountings thereof.

3,909,907

METHOD FOR INSTALLING FURNACE LININGS

Joseph Davis, Frankston, Australia, assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Apr. 1, 1974, Ser. No. 457,512
Int. Cl. B23q *37/00*
U.S. Cl. 29—407 5 Claims



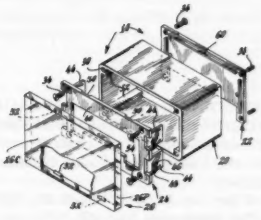
5. A method for the installation of insulating lining materials which comprises applying a flexible ceramic insulation blanket to a surface by impaling said blanket on temporary locating pin means attached to said surface, forming apertures in said blanket at points located by said temporary pin means, removing said temporary pin means, and attaching ceramic retainers in said apertures and to said surface to permanently affix said blanket to the surface.

3,909,908

METHOD FOR MAKING CASES FOR PANEL-MOUNTED ELECTRICAL INSTRUMENTS

Paul E. Brefka, Southboro, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Division of Ser. No. 304,732, Nov. 8, 1972, Pat. No. 3,793,563.
This application Jan. 3, 1974, Ser. No. 430,466
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—417 9 Claims



1. A method for making protective cases for electrical instruments of varying sizes to be mounted upon instrument panels in uniform openings provided therein, comprising:

extruding a tubular member with a uniform cross sectional shape providing all of the side walls of the body for the case and, during extrusion, forming fastener receiving means extending throughout the length of the tubular member;

cutting the extruded tubular member into individual bodies each with side walls of a preselected length to accommodate the particular instrument to be housed therein;

forming a plurality of uniformly shaped panel mounting end members arranged to fit the uniform panel openings;

fastening panel-mounting end members on the front ends of the cut tubular bodies by means of fasteners inserted in the receiving means formed in the tubular body;

forming a plurality of uniformly shaped front covers; and

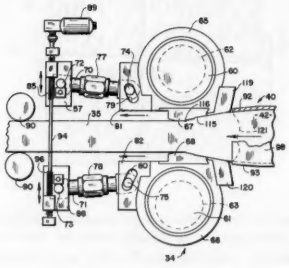
fastening the front covers over the panel mounting end members.

3,909,909

HARMONIC PRESS AND METHOD OF FORGING

Mark E. Whalen, Pepper Pike, and Joseph W. Malleck, Chagrin Falls, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Division of Ser. No. 164,788, July 21, 1971, Pat. No. 3,783,494. This application Oct. 4, 1973, Ser. No. 403,422
Int. Cl.[2] B21B *13/18*
U.S. Cl. 29—420.5 **16 Claims**



1. The method of forging a workpiece with a press of the harmonic type having opposed platens mounted on eccentrics for relative movement comprising:

a. positioning a workpiece for travel along a feed path between said platens;

b. constraining the platens for movement such that any point on each of said platens transcribes an initial forging path which is substantially reciprocal and transverse to said feed path;

c. feeding a leading end of said workpiece along said feed path and between said platens to commence a forging compaction of said workpiece;

d. thereafter changing the constraint on said platens such that each such point traverses another foring path having workpiece feed motion paralleling said feed path such that the press self feeds the workpiece as it is forged; and,

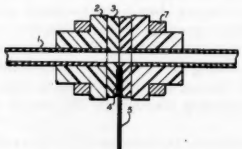
e. perimetrically confining the workpiece at a location along said feed path and near said platens.

3,909,910

METHOD OF JOINING THE ENDS OF TWO CONDUITS TOGETHER IN A STERILE MANNER

Arthur W. Rowe, Stamford, Conn., and Edward T. Marshall, Short Hills, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 346,087, March 29, 1973, Pat. No. 3,865,411. This application Aug. 23, 1974, Ser. No. 499,931
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—423 **7 Claims**



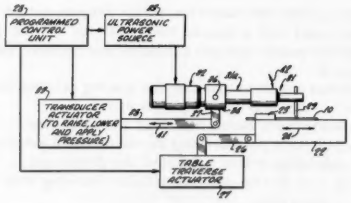
1. A method of joining the ends of two conduits together in a sterile manner which comprises providing each end of the conduits to be connected with a connector which comprises a resilient, deformable gasket disposed about the terminal end of a conduit, a continuous, removable, yieldable, flexible strip material, a portion of which is removably adhered to said gasket and overlies the end of said conduit, said strip material having a free end, said strip material being in generally U-shaped configuration whereby a force applied to the free end thereof withdraws the entire strip material to expose the end of the conduit, arranging the connectors in face-to-face alignment so that the ends of the conduit are in registry, drawing the connectors together so that the gasket of each connector is deformed inwardly and so that the free ends of the strip material are substantially parallel and withdrawing the strip material from each of said connectors at the same time.

3,909,911

METHOD FOR REMOVING INSULATING AND SHIELDING MATERIALS FROM FLAT CONDUCTORS, CIRCUITS AND COMPONENTS

Michael C. Smith, Costa Mesa, and Hal W. Smith, Jr., Balboa Island, both of Calif., assignors to Orthodyne Electronics, Costa Mesa, Calif.

Filed Apr. 30, 1973, Ser. No. 355,975
Int. Cl. B23p *19/02*
U.S. Cl. 29—427 **33 Claims**


PROGRAMMED CONTROL UNIT
ULTRASONIC POWER SOURCE
TRANSDUCER ACTUATOR (TO RAISE, LOWER AND APPLY PRESSURE)
TABLE TRAVERSE ACTUATOR

14. A method of removing covering layer means, including a heat-resistant synthetic resin dielectric, from a flat surface of an electrically conductive element, which comprises:

a. providing a tool having a tip portion shaped for skiving movement over the flat surface of an electrically conductive element without effecting damage to such element,

b. causing said tip portion to vibrate at an ultrasonic frequency,

c. causing the directions of the ultrasonic vibrations, and the amplitude and power thereof, to be such that skiving movement of said tip portion over said surface will peel off said covering layer means, including a heatresistant synthetic resin dielectric, without causing damage to said electrically conductive element, and

d. effecting relative traverse movement between said tool and said surface to cause said tip portion to traverse said surface in a skiving manner and thus to peel off a chip of said covering layer means including a heat-resistant synthetic resin dielectric.

3,909,912

METHOD OF MAKING A PREFABRICATED ELECTRICAL WALL STRUCTURE

Casper Kiesling, Glendale, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Division of Ser. No. 386,713, Aug. 8, 1973, Pat. No. 3,842,320. This application July 30, 1974, Ser. No. 493,140
Int. Cl.[2] H05K *3/22*
U.S. Cl. 29—428 **5 Claims**

1. A method of making a prefabricated wall structure for covering substantially an entire wall of a room of a structure, said wall structure comprising the steps of

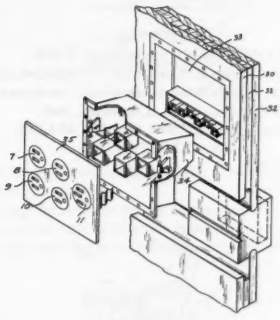
preparing a sheet of plastic material for supporting a plurality of electrical conductors;

coating an electrically conductive copper sheet with colored plastic insulating material on one surface and adhesive material on the other surface;

applying a strip of removable protective material to the adhesive material;

stamp cutting wire strips and leads in a plurality of predetermined shapes and dimensions;

forming channels of predetermined configurations and dimensions in predetermined patterns in the sheet of plastic material;



removing the protective material from the electrical conductors;

inserting the electrical conductors in the channels formed in the sheet of plastic material; and

releasably magnetically affixing the sheet of plastic material to a wall of a structure.

3,909,913

METHOD OF JOINING SHEETS BY USE OF FASTENERS

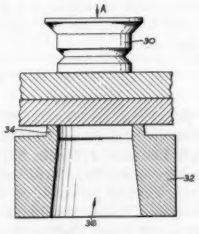
James Matthew George Tildesley, Hilton, near Bridgnorth, England, assignor to Ocean Investments (Gibraltar) Limited, Gibraltar

Filed June 24, 1974, Ser. No. 482,450

Claims priority, application United Kingdom, July 19, 1973, 34441/73

Int. Cl.[2] B23P *11/00*

U.S. Cl. 29—432 **3 Claims**



1. A method of joining an assembly of metal sheets, while punching an area from the assembly, that comprises the steps of supporting the assembly on a die having an assembly-supporting surface containing an opening which defines the area to be punched out and is bounded by a rib projecting from said supporting surface, and pressing into the assembly in alignment with said opening, a fastener comprising a head, and a shank having a cross-section that coincides with said opening, and having a groove encircling the shank adjacent to the punch end thereof, the distance between the punch end of the shank and the adjacent edge of the groove being at least as great as the height of the rib, the volume of the rib being at least as great as the volume of the groove, the length of the fastener being equal to the thickness of the assembly, and the pressing stroke being long enough to insert the punch end of the fastener into said opening to a level even with said supporting surface, to bring the inserted fastener flush with both sides of assembly.

3,909,914

METHOD OF FORMING A STRUCTURE USING JOINTING MEMBERS

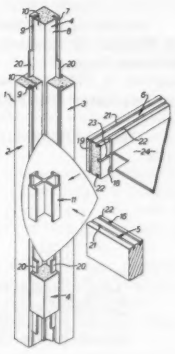
Michael W. Symons, Wissett Cottage, Hook Heath Road, Woking, England

Division of Ser. No. 98,682, Dec. 16, 1970, Pat. No. 3,774,344. This application Aug. 30, 1973, Ser. No. 393,126

Claims priority, application United Kingdom, Dec. 22, 1969, 62402/69; May 14, 1970, 23485/70

Int. Cl.[2] B23P *15/00;* **A47B** *43/00;* **A47F** *5/00*

U.S. Cl. 29—433 **8 Claims**



1. A method of forming a structure including four continuous vertical rails extending the full height of the structure and positioned at the corners thereof, each continuous vertical rail having first and second faces extending at right-angles one to the other and formed to present a longitudinally extending groove in each of the first and second faces, comprising forming a rectangular frame comprising four horizontally extending rails, secured together at the corners of the frame by means of four jointing members, each jointing member being formed by a plurality of integral webs and flanges relatively so disposed as to present at least three recesses, each one of the recesses being formed by two members of two webs disposed at right-angles and a pair of flanges, one extending from each of said two surfaces, each flange of each pair extending at right-angles from its respective one of the surfaces and at right-angles to the other one of the flanges of the respective pair, each end of each of the horizontally extending rails having first and second faces extending in planes at right-angles one to the other and being formed to present a groove in each of said first and second faces, comprising aligning said first and second faces at one end of a first of the horizontal rails, each substantially coplanar with respective faces of said two surfaces of a first of the recesses of a first of the jointing members, aligning said first and second faces at one end of a second of the horizontal rails, each substantially coplanar with respective surfaces of said two surfaces of a second of the recesses of the first jointing member and having the first horizontal rail and the second horizontal rail relatively longitudinally of the first jointing member to engage the two flanges of the first recess respectively in the grooves in the first and second faces in said one end of the first horizontal rail and to engage the two flanges of the second recesses respectively in the grooves in the first and second faces in said one end of the second horizontal rail, thereby to join the first horizontal rail to the second horizontal rail mutually at right angles, joining together in similar manner the other ends of the first and

second horizontal rails to third and fourth horizontal rails respectively and the third and fourth rails together, using second, third and fourth jointing members, aligning the first and second faces of each of the continuous vertical rails each substantially coplanar with respective surfaces of said two surfaces of a third of the recesses of a respective one of the jointing members, moving the frame relatively longitudinally of the vertical rails to engage the two flanges of the third of the recesses of each of the jointing members respectively in the grooves of the first and second faces of a respective one of the continuous vertical rails, forming a second frame in similar manner to the method in which the first frame was formed, engaging the second frame with the continuous vertical rails in like manner to the manner in which the first frame was engaged therewith and spacing the two frames vertically one from the other by means of spacers.

3,909,915

BONDING APPARATUS

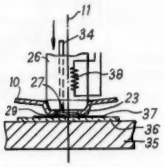
Leopold Samuel Phillips, 30 Howberry Road, Canons Park, Edgware, Middlesex, England

Filed Oct. 3, 1973, Ser. No. 403,103

Claims priority, application United Kingdom, Oct. 10, 1972, 46621/72

Int. Cl.[2] B23K *31/02*

U.S. Cl. 228—160 **14 Claims**



1. The method of effecting the individual compliant bonding of a single beam-lead semi-conductor device having any one of a range of different body sizes to a substrate which comprises the steps of:

a. providing a device for effectuating said bonding having a bonding ram movement axis;

B. providing a strip of compliant medium traversing the axis;

C. providing a multi-sized punching device having the capability of selectively punching one of a number of variously sized windows through the said medium;

D. advancing the strip across the axis to present an unworked region thereof at the axis;

E. moving the punching device to a punch position with portions of the device on both sides of the medium;

F. selecting the single semi-conductor device;

G. adjusting the punching device to align a selected sized punch carried by the punching device in precise alignment with the axis;

H. punching a selected sized window corresponding with the selected semi-conductor device through the medium at the axis;

I. removing the punching device to a rest position;

J. effectuating bonding of the selected semi-conductor device to the substrate using the area of the medium adjacent the thus formed window.

14. A device for effectuating the individual compliant bonding of beam-leads semi-conductor devices to a substrate comprising: a base member, a ram member mounted for movement with respect to said base member along a single axis, compliant medium supply and takeup means associated with said base member for selectively presenting unworked portions of a strip compliant medium carried by said supply and takeup means traverse said axis in a position to be contacted by portions of the said ram member, a punching member carried by said base member, said punching member having a plurality of different sized punches carried thereby, means for selectively presenting one of said punches at a work position stradling said strip, means for actuating said selected punch to punch a window through said medium at said axis coincident with said axis whereby any one of a number of variously sized windows can be provided in the tape by selection of one of said punches carried by said punching device.

3,909,916

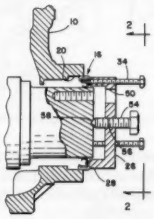
COMPONENT REMOVAL TOOL

Robert L. Neff; Charles R. Mote, both of Columbus, and James E. McNaulty, Elizabethtown, all of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed June 21, 1974, Ser. No. 481,855

Int. Cl.[2] B25B *27/02*

U.S. Cl. 29—235 **9 Claims**



1. Apparatus for removing a component received in a recess in a housing, said apparatus comprising:

a base adapted to be releasably fixed relative to said housing:

at least one puller screw having a feed section with machine threads threadedly engaging said base in line with said component, said puller screw having a nose section including a drill point and self-taping threads for penetrating into said component as said puller screw is threaded into said base; and

an element removably connected to said base and having an end face displaceable therefrom for displacing said base away from said housing thereby removing said component from said recess.

3,909,917

METHOD OF BRAZING REFRACTORY METALS AND COMPOUNDS BASED THEREON

Viktor Fedorovich Lebedev, Prospekt Mira, 110/2 kv. 328; Anatoly Petrovich Zaitsev, Ba. Mariinskaya ulitsa, 17; Pavel Fishelevich Kvin, Zemsky pereulok, 9, kb. 5; Viktor Mikhailovich Shuboderov, Yasny proezd. 30, korpus 2, kv. 49; Vladimir Grigorievich Piljus, Shmitovsky proezd, 12, kv. 50; Nina Nikodimovna Filimonova, Avangardnaya ulitsa 6, korpus 1, kv. 164, and Svetlana Ivanovna Suslakova, ulitsa Bashova, 15, korpus 1, kv. 102, all of Moscow, U.S.S.R.

Continuation of Ser. No. 387,034, Aug. 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 330,191, Feb. 7, 1973, abandoned, which is a continuation of Ser. No. 67,791, Aug. 28, 1970, abandoned. This application Oct. 7, 1974, Ser. No. 512,611

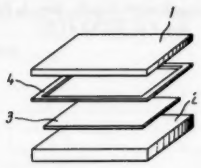
Int. Cl.[2] B23K *1/04*

U.S. Cl. 228—216 **4 Claims**

1. A method of brazing articles of refractory metals, refractory alloys and compounds based on these metals which comprises:

a. placing a filler into an envelope of a material whose melting point is higher than that of the filler, the envelope being located along the periphery of the filler;

b. placing the envelope and the filler between the articles to be connected so that the envelope and the surfaces of the articles form a closed cavity enclosing the filler;
c. subjecting the articles and the envelope to diffusion welding at a temperature below the melting point of the filler,



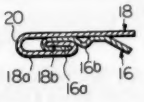
in order to hermetically seal the closed cavity enclosing the filler; and then
d. heating the articles being connected together with the filler and the envelope to the melting point of the filler for melting the filler and connecting the filler with the articles.

3,909,918

METHOD OF JOINING THE EDGE PORTIONS OF TWO SHEETS

Hideo Takizawa, Hachioji; Hiroyuki Aida, Tokyo; Yoshiyuki Miyabayashi, Tokyo, and Norihiro Tsuneishi, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jan. 29, 1974, Ser. No. 437,715
Claims priority, application Japan, Jan. 31, 1973, 48-13528
Int. Cl.[2] B21D *39/00;* **B23P** *11/00*
U.S. Cl. 29—509 **3 Claims**



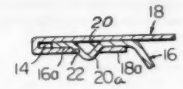
1. A method of joining two sheets at their edges, comprising the steps of:
a. bending an edge of one sheet to form a first predetermined angle with a reference surface of the one sheet;
b. placing the sheets together so that an edge portion of the other sheet extends beyond the bent edge of the one sheet;
c. folding the edge portion of the other sheet back over the first sheet so that mating surfaces of the two sheets are in tight contact and the bent edge of the one sheet is enclosed by the folded over edge portion of the other sheet;
d. bending an edge of the other sheet to form a second predetermined angle with a reference surface of the other sheet;
prior to performing step *b;*
and in which the sheets are relatively oriented during step *b* so that when step *c* is performed, the bent edge of the one sheet will be folded over the bent edge of the other sheet, and the bent edge of the other sheet will be folded over the bent edge of the one sheet; and
e. forming a raised portion on the one sheet near the bent edge thereof extending normally from the one sheet in the same direction as the bent edge thereof;
the raised portion being spaced from the bent edge of the one sheet so that when step *c* is performed, the folded bent edges of the sheets will be spaced between the raised portion and the folded back end of the other sheet, and the raised portion will engage with the folded bent edge of the other sheet to prevent relative movement thereof.

3,909,919

METHOD OF JOINING THE EDGE PORTIONS OF TWO SHEETS

Yoshiyuki Miyabayashi, Seki; Hideo Takizawa, Hachioji; Norihiro Tsuneishi, and Hiroyuki Aida, both of Tokyo, all of Japan, assignors to Nissan Motor Company Limited, Japan

Filed Jan. 29, 1974, Ser. No. 437,713
Claims priority, application Japan, Jan. 31, 1973, 48-13526
Int. Cl.[2] B21D *39/00;* **B23P** *11/00*
U.S. Cl. 29—521 **12 Claims**



1. A method of joining two sheets, comprising;
a. providing a first sheet with a hole extending through an edge portion of the sheet;
b. providing an edge portion of a second sheet with a raised portion having a shape conjugate to the shape of said hole;
c. placing the sheets together with at least parts of them overlying one another and with one of said edge portions disposed adjacent to and extending beyond the other edge portion; and
d. thereafter folding said one edge portion back to place the two edge portions in mutually overlying relationship, to insert said raised portion into said hole and thereby to hold mating surfaces of the edge portions in fixed contact with one another.

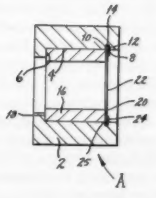
12. A method of joining two sheets, comprising;
punching an edge portion of a first sheet to provide a first lug in a first hole in said edge portion;
punching an edge portion of another sheet to provide a second lug in a second hole therein;
placing the sheets together in at least partly mutually overlying relationship and with one of said edge portions disposed adjacent to and extending beyond the other edge portion; and
folding said one edge portion back over said other edge portion so that said first and second lugs intrude into said second and first holes respectively and that mating surfaces of the sheets are in contact with one another.

3,909,920

METHOD OF RETAINING AN INNER PART WITHIN THE BORE OF AN OUTER PART

Robert F. Cornish, North Canton, and Daniel E. Popa, Massillon, both of Ohio, assignors to The Timken Company, Canton, Ohio

Filed Mar. 18, 1974, Ser. No. 451,834
Int. Cl.[2] B21D *39/00;* **B23P** *11/02*
U.S. Cl. 29—522 **17 Claims**



1. A process for retaining a rigid inner part within a bore in a rigid outer part with no relative movement between the parts in the direction of the axis for the bore, the outer part having a backing surface for locating the inner part in a predetermined axial position within the bore and a groove opening into the bore at the end of the inner part when the inner part is

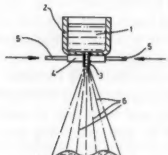
located in the predetermined axial position by the backing surface, said process comprising: holding a retaining element against the end of the inner part when the inner part is in the predetermined position within the bore, the retaining element having a lip directed away from the end of the inner part generally in the axial direction and being inclined inwardly toward the axis of the bore; and while the retaining element is held against the inner part and the inner part is in said predetermined position, deforming the lip plastically into the groove by applying an axially directed force to the lip while preventing the lip from moving substantially inwardly toward the axis of the bore, whereby the retaining element becomes lodged in the groove and prevents withdrawal of the inner part from the bore.

3,909,921

METHOD AND APPARATUS FOR MAKING SHAPED ARTICLES FROM SPRAYED MOLTEN METAL OR METAL ALLOY

Reginald Gwyn Brooks, Swansea, Wales, assignor to Osprey Metals Limited, Neath, Wales

Continuation-in-part of Ser. No. 297,866, Oct. 16, 1972, Pat. No. 3,826,301. This application July 9, 1974, Ser. No. 486,919
Claims priority, application United Kingdom, Oct. 26, 1971, 49646/71; June 6, 1972, 26307/72The portion of the term of this patent subsequent to July 30, 1991, has been disclaimed.
Int. Cl.[2] B22D *23/00*
U.S. Cl. 29—527.2 **9 Claims**



1. A method of manufacturing a shaped precision article comprising the steps of directing a stream of molten metal or metal alloy onto a spaced collecting surface having a temperature appreciably less than the melting point of said metal or metal alloy, atomizing said stream by subjecting it to high velocity jets of an inert gas having an initial temperature that is appreciably less than that of said molten metal or metal alloy, said gas temperature being such that sufficient heat is extracted by said gas from said molten metal or metal alloy during flight to said surface that said deposited metal or metal alloy forms a coherent deposit and its formation is independent of the other thermal properties of said surface, and working said deposit by a die to form said article.

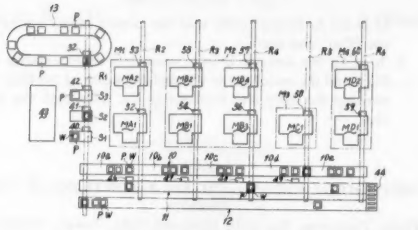
5. Apparatus for manufacturing a shaped precision article comprising means for directing a stream of molten metal or metal alloy onto a spaced collecting surface having a temperature appreciably less than the melting point of said metal or metal alloy, means for atomizing said stream by subjecting it to high velocity jets of an inert gas having an initial temperature that is appreciably less than that of said molten metal or metal alloy, said gas temperature being such that sufficient heat is extracted by said gas from said molten metal or metal alloy during flight to said surface that said deposit is coherent and its formation independent of the other thermal properties of said surface, and means for working said deposit by a die to form said article.

3,909,922

CONTROL SYSTEM FOR PLURAL NUMERICALLY CONTROLLED MACHINE TOOLS

Akira Takasaki, Toyota; Yoshio Shima, Obu, and Takehiko Hayashi, Toyota, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Japan

Filed July 23, 1973, Ser. No. 381,625
Claims priority, application Japan, Aug. 1, 1972, 47-77407
Int. Cl.[2] B23Q *41/02*
U.S. Cl. 29—563 **3 Claims**



1. A control system for plural numerically controlled machine tools comprising:

main conveyor means for transferring in one direction a plurality of work pallets each being accorded with a coded number;

buffer conveyor means movable in the same direction as said main conveyor and having a plurality of buffer areas each being disposed in parallel relation with and adjacent to said main conveyor means;

a plurality of machining modules each including at least one numerically controlled machine tool and classified by a machining process in association with each buffer area of said buffer conveyor means;

a plurality of rails each arranged above the respective machining module and extending above and tranversely of said main and buffer conveyor means;

pallet transfer means suspended by each of said rails for selectively transferring said work pallets into the associated buffer area and main conveyor means and for selectively transferring said work pallets from the associated buffer area into the associated machining module in response to the coded numbers on said work pallets such that a preselected priority pallet can be transferred directly from said main conveyor to a preselected machining module in order to by-pass any pallets on said buffer conveyor means;

each of said machine tools being provided with a support base for exchanging said work pallet between the machine tool and said pallet transfer means associated therewith;

at least one of said machining modules including not less than two numerically controlled machine tools each provided with an automatic tool change device and performing the same machining operation in the classified machining process and arranged along said rail; and

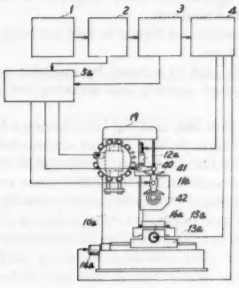
a central control device for transmitting information to each of said numerically controlled machine tools in accordance with the coded number of the work pallet transferred in the machine tool.

3,909,923

NUMERICALLY CONTROLLED MACHINE TOOL WITH MISCELLANEOUS FUNCTION CONTROL CIRCUIT TO REDUCE UNPRODUCTIVE PERIODS TO A MINIMUM

Mikishi Kurimoto, Nagoya, and Hiroyasu Takegawa, Kariya, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Japan

Filed Dec. 14, 1972, Ser. No. 315,011
Int. Cl.[2] B23Q 3/157
U.S. Cl. 29—568 5 Claims



1. A numerically controlled machine tool provided with feed means for performing a three dimensional motion between a tool and a workpiece on a work table, tool changing means for transferring each of a plurality of varied tools in succession to and from a machining station, a miscellaneous function control circuit for controlling miscellaneous functions thereof, and numerical control means for controlling said feed means and said miscellaneous function control circuit in accordance with programmed information, the improvement of said miscellaneous function control circuit comprising:

first relay circuit means for starting one function of said miscellaneous functions when an operation of said feed means is completed;

second relay circuit means for starting said one miscellaneous function independently of the operation of said feed means;

command circuit means for selectively operating one of said first relay circuit means and said second relay circuit means in accordance with said programmed information, said command circuit means including relays operable in response to said programmed information for identifying said miscellaneous functions for operating said second relay circuit means, and an interlocking relay responsive to said numerical control means for operating said first relay circuit means; and

control circuit means operated by said one of said first and said second relay circuit means for performing said one miscellaneous function in a mode directed by said one relay circuit means to avoid damage of said machine tool by performances thereof.

3,909,924

METHOD OF FABRICATION OF SILICON PRESSURE TRANSDUCER SENSOR UNITS

Alfons Vindasius, Sunnyvale, and William F. Hare, Portola Valley, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 27, 1974, Ser. No. 455,050
Int. Cl.[2] B01J 17/00
U.S. Cl. 29—574 3 Claims

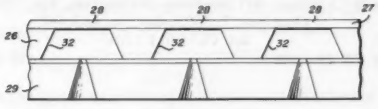
1. The method of forming semiconductor transducer sensors comprising the steps of:

forming a semiconductor layer on an upper surface of a semiconductor substrate,

forming a plurality of spaced apart cavity regions in said substrate, said layer remaining to serve as flexible diaphragms for piezoresistor bridge circuits formed in each of said diaphragms,

forming a backing plate of semiconductor material including forming an oxide layer on the upper surface of said backing plate,

forming a plurality of spaced apart openings in the underside of the backing plate so as to be in alignment with the cavity regions in said substrate, said openings forming a portion of a port at each cavity region position, said ports stopping at the oxide layer formed on the upper surface of said backing plate,



sealing the upper surface of said backing plate to said substrate under vacuum such that evacuated cavities are formed in said substrate, said cavities including said diaphragms as one wall of each cavity and said oxide layer in said ports serving as a portion of another wall of each cavity whereby absolute pressure sensor cavities are formed in the substrate,

electrically testing the bridge circuits in the flexible diaphragms of the cavities,

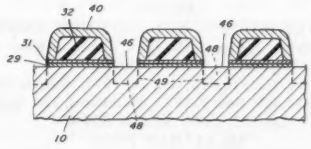
and thereafter converting said absolute pressure sensor cavities to ambient pressure sensor cavities by puncturing said oxide layers in said ports in said backing plate, thereby establishing a port opening into the associated cavity.

3,909,925

N-CHANNEL CHARGE COUPLED DEVICE FABRICATION PROCESS

Leonard Forbes, and Jerry R. Yeargan, both of Fayetteville, Ark., assignors to Telex Computer Products, Inc., Tulsa, Okla.

Filed May 6, 1974, Ser. No. 467,055
Int. Cl.[2] B01J 17/00
U.S. Cl. 29—578 9 Claims



1. In the process of making a semi-conductor charge coupled device in which a metal transfer gate is positioned in the space between two spaced-apart silicon storage gates, the improvement comprising the steps of

a. preparing a chip of silicon semi-conductor;

b. forming a thin continuous first layer of silicon dioxide on top of said chip;

c. forming a thin continuous second layer of silicon nitride on top of said first layer;

d. forming a thick layer of polycrystalline silicon (polysilicon) on top of said second layer, said third layer being etched in the shape of spaced rectangular areas of selected size and spacing;

e. forming a thick fourth layer of silicon dioxide completely covering all exposed areas of said third layer;

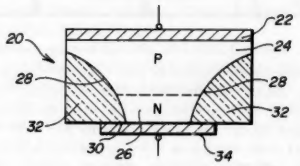
f. etching away said second silicon nitride layer between said areas of silicon dioxide coated polysilicon;
g. forming a thin fifth layer of silicon oxide over said areas of silicon dioxide coated polysilicon and over the space between said areas;
h. depositing a sixth metal layer over said fifth layer in the space between said spaced apart areas of said fourth layer; and
i. providing conductor means to contact said areas of said third layer.

3,909,926

METHOD OF FABRICATING A SEMICONDUCTOR DIODE HAVING HIGH VOLTAGE CHARACTERISTICS

Jearld L. Hutson, 907 Newberry, Richardson, Tex. 75080

Filed Nov. 7, 1973, Ser. No. 413,542
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—580 **10 Claims**



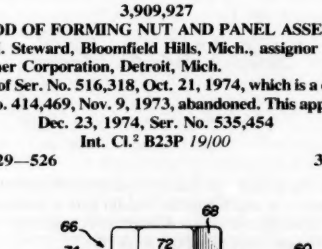
1. A method of fabricating a semiconductor device comprising:
forming a patterned layer of metal over a first exterior surface of a semiconductor body of one conductivity type having first and second opposed exterior surfaces,
diffusing impurities into said body to form an area of the opposite conductivity type having a relatively large thickness beneath said layer of metal wherein the formed p-n junction below said metal layer is closer to said second surface,
inwardly contouring the periphery of said body below said patterned layer such that the sectional area of said body parallel to said exterior surfaces diminishes from the region of said diffused area at said first exterior surface to said second exterior surface,
filling the contoured periphery of said body with passivating material, and
applying an electrode to said second exterior surface.

3,909,927

METHOD OF FORMING NUT AND PANEL ASSEMBLY

Joseph H. Steward, Bloomfield Hills, Mich., assignor to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 516,318, Oct. 21, 1974, which is a division of Ser. No. 414,469, Nov. 9, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,454
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—526 **3 Claims**



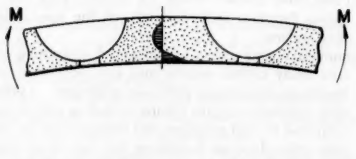
1. A method of forming a nut and panel assembly, comprising the steps of:
a. supporting the pilot of a nut blank having a projecting pilot portion and a lateral flange portion on an anvil having a circular opening; said nut being readily machineable and relatively hard,
b. piercing the nut blank to form a bore by impacting the flanged end of said nut with a cylindrical punch coaxially alinged with said anvil opening, said anvil opening having a diameter at least 13 percent greater than said punch, thereby breaking-out a conical opening through the end of said nut pilot having a major diameter at said pilot end generally equal to the diameter of said anvil opening and forming a cylindrical bore portion at the impacted flanged end of said nut
c. forming a continuous thread in said nut bore cylinder and conical portions,
d. securing said nut to a panel by inserting said pilot end through a panel opening and securing the nut in place, and
e. threading a bolt into said nut bore having a head portion, a threaded shank portion and an unthreaded shank portion adjacent said head, said unthreaded shank portion having a diameter greater than the minor crest diameter of said cylindrical bore portion and less than the major diameter of said conical portion adjacent said pilot end, by threading the shank portion of said bolt into said bore, through said pilot end and receiving said unthreaded shank portion of said bolt in said conical bore portion.

3,909,928

METHOD FOR MANUFACTURING A SHADOW MASK

Kazuo Sato, Tokyo, and Soji Takahashi, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 21, 1974, Ser. No. 444,569
Claims priority, application Japan, Feb. 21, 1973, 48-20167; July 4, 1973, 48-75358
Int. Cl.[2] B23P *13/04*
U.S. Cl. 29—557 **11 Claims**



1. A method for manufacturing a shadow mask, comprising a first step of annealing a material of low-carbon sheet steel, a second step of thereafter subjecting the annealed sheet steel to skin-pass rolling for a reduction of 0.5 – 15% in thickness thereby providing a predetermined thickness, a third step of thereafter forming holes in the sheet steel, and a fourth step of thereafter press-forming the sheet steel into a desired plane.

3,909,929

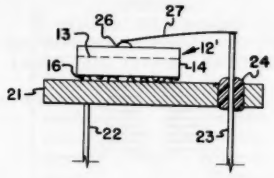
METHOD OF MAKING CONTACTS TO SEMICONDUCTOR LIGHT CONVERSION ELEMENTS

John R. Debesis, Richmond Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,803
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—590 **10 Claims**

1. A method of making electrical contact to a semiconductor light conversion element, comprising the steps of providing a layer of metal on a surface of said element, temporarily heating said metal layer to cause it to separate into distributed

individual lumps of metal sintered onto said surface of the element, and making an electrical contact to at least some of



said distributed lumps of metal over substantially the entire said surface.

3,909,930

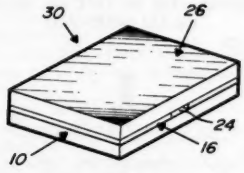
METHOD FOR FABRICATING A LIQUID CRYSTAL DISPLAY DEVICE

Richard W. Gurtler, Mesa, Ariz., assignor to Motorola Inc., Chicago, Ill.

Filed May 23, 1972, Ser. No. 256,028

Int. Cl.[2] G02F *1/16*

U.S. Cl. 29—592 **11 Claims**



1. The method of fabricating a liquid crystal display device comprising the steps of:

providing a first insulative electrode carrying plate;

depositing a layer of photopolymeric material thereon of a predetermined thickness of the order of 0.0005 inches;

removing a portion of the photopolymer layer to provide a cavity in the photopolymeric material, thereby exposing the electrodes on the plate;

joining a second insulative electrode carrying plate to the surface of the photopolymeric layer;

bonding the plates and layer together with said photopolymeric layer forming a seal about said cavity;

providing an opening for communication with said cavity;

filling said cavity, through said opening, with a liquid crystal composition; and

sealing said opening with a suitable material.

3,909,931

METHOD FOR SECURING WINDING BARS IN SLOTS OF ELECTRIC GENERATORS

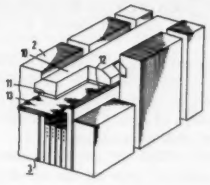
Dietrich Lambrecth, Mulheim (Ruhr), Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Continuation of Ser. No. 319,311, Dec. 29, 1972, abandoned. This application May 23, 1974, Ser. No. 472,642

Int. Cl.[2] H02K *15/06*

U.S. Cl. 29—596 **1 Claim**

1. Method for securing a winding bar in a slot of an electric machine, said slot being adapted to receive a wedge comprising the steps of: inserting a corrugated spring in said slot on top of said bar, said spring extending in the longitudinal direction of the slot, inserting a pressure member on top of said spring, and applying tensioning force to said spring, solely by inserting a wedge into said slot in said longitudinal direction, said spring having a spring characteristic which is linear up to



70% of the maximum expanded state of the spring, said spring being compressed solely through the insertion of the slot closing wedge to at least 80% of its expanded state.

3,909,932

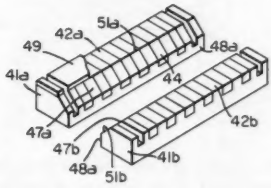
METHOD OF MANUFACTURING A MULTITRACK MAGNETIC HEAD

William L. Kroon, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Division of Ser. No. 409,045, Oct. 23, 1973, Pat. No. 3,843,968, which is a continuation of Ser. No. 156,801, June 25, 1971, abandoned. This application July 22, 1974, Ser. No. 490,309

Int. Cl.[2] G11B *5/42*

U.S. Cl. 29—603 **9 Claims**



1. A method of constructing a magnetic head assembly comprising the steps of, forming a plurality of slots in a block of ceramic material, glass bonding a plurality of pieces of magnetic ferrite material in said slots, cutting said block along a plane intercepting said ferrite pieces to form at least two severed block portions each carrying portions of said ferrite pieces, securing said block portions together to form a face part for said head assembly with respective ones of said ferrite pieces of each block portion aligned and a layer of nonmagnetic gap forming material disposed therebetween such that a face part having a plurality of spaced magnetic head pole tips is formed, and mounting said face part onto a core housing carrying a plurality of core members and coil means with said core members each arranged to engage associated ferrite pieces of said face part to complete magnetic circuits traversing the nonmagnetic gaps therebetween.

3,909,933

METHOD FOR TRANSFERRING AND BONDING ARTICLES

Edward R. Doubek, Jr., Brookfield; John J. Kennedy, Riverside, and Donald K. Sandmore, Oak Lawn, all of Ill., assignors to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 346,559, March 30, 1973, Pat. No. 3,838,274. This application Apr. 26, 1974, Ser. No. 464,423

Int. Cl.[2] G01J *1/20*

U.S. Cl. 29—626 **4 Claims**

1. In a method of bonding circuit elements to a substrate at selected areas on a surface thereof;

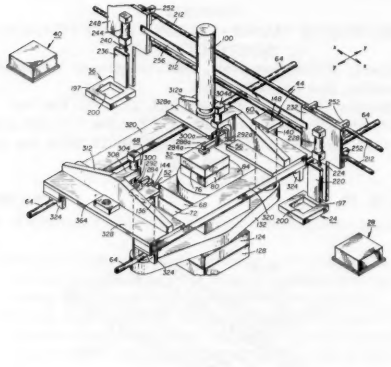
moving a first group of circuit elements along *x-y* axes to position successive elements thereof in a first pickup position;

moving a second group of circuit elements along x-y axes to position successive elements thereof in a second pickup position;

moving the substrate along x-y axes to position successive selected areas of the substrate in a bond position;

alternately picking up each of the elements of the first and the second groups of circuit elements moved to the first and the second pickup positions;

transferring each picked up circuit element of the first group to the selected area on the substrate then at the bond position, while the step of moving the second group of circuit elements is taking place;



bonding the transferred circuit element of the first group to the selected area on the substrate at the bond position while the step of picking up a circuit element of the second group at the second pickup position is taking place;

transferring each picked up circuit element of the second group to the selected area on the substrate then at the bond position, while the step of moving the first group of circuit elements is taking place, and

bonding the transferred circuit element of the second group to the selected area on the substrate at the bond position while the step of picking up a circuit element of the first group at the first pickup position is taking place.

3,909,934

METHOD OF PRODUCING A MEASURING HEAD FOR MEASURING ELECTRICAL COMPONENTS

Richard Epple, Schwaigern, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am main, Germany

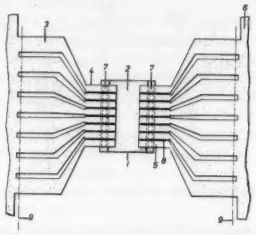
Filed Dec. 3, 1973, Ser. No. 421,164

Claims priority, application Germany, Dec. 2, 1972, 2259132

Int. Cl.[2] H01R *43/00*

U.S. Cl. 29—628 **6 Claims**

1. A method of producing a measuring head for measuring electrical components which comprises a carrier body having a plurality of narrow contact strips attached to a surface thereof, said method comprising the steps of: providing a carrier body having a central recess extending to one surface thereof; placing a sheet of contact material, which is coherent in at least the portion thereof which is to overlie said one surface of said carrier body, on said one surface so that one end of said sheet extends over said recess; attaching said sheet to said one surface; and thereafter dividing said coherent



portion into said plurality of narrow contact strips so that one end of each of said strips extends over said recess.

3,909,935

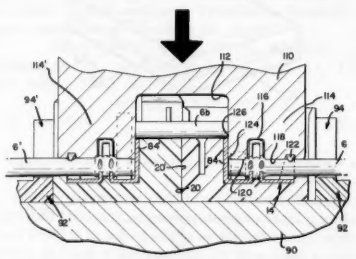
PRE-LOADED ELECTRICAL CONNECTORS, ASSEMBLY APPARATUS AND METHOD

Lionel Dennis Aldridge, Seminole, and Edward Dennman Bunnell, Palm Harbor, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 321,505, Jan. 8, 1973, Pat. No. 3,842,392. This application July 25, 1974, Ser. No. 491,893

Int. Cl.[2] H01R *43/00*

U.S. Cl. 29—628 **5 Claims**



1. A method of connecting predetermined conductors to predetermined terminals in each of two mateable electrical connectors said connectors having a row of contact terminals therein, each terminal occupying a distinct position in said row in one connector and corresponding to the terminal in the same position in the other connector, each contact terminal having a contact portion and a conductor-receiving portion which is adapted to receive a conductor upon movement of said conductor laterally of its axis towards said conductor receiving portion, said method comprising the steps of:

positioning said connectors adjacent to each other with said row of terminals in each connector extending substantially parallel to the row of terminals in the other connector, and with the said contact portion of each row proximate to the contact portion of the said terminals in the other row and the said wire-receiving portions remote from each other,

locating intermediate portions of said conductors across said rows with the axes of each conductor in alignment with the said conductor-receiving portions of two corresponding terminals in each of said rows, said connectors being positioned so that each pair of corresponding terminals is in alignment,

moving said conductors laterally of their axes towards said terminals and securing each conductor to the conductor-receiving portions of two opposed corresponding terminals, and

cutting out the portion of each conductor which extends between each pair of corresponding terminals.

3,909,936

PLASTIC FILM INSERT

Jimmy C. Ray, Rt. 2, Box 33, Denison, Tex. 75020

Filed Sept. 30, 1974, Ser. No. 510,475
Int. Cl.² H02G *15/00*
U.S. Cl. 29—629 **4 Claims**

1. The method of inserting plastic film strips into B-Wire connectors with a tool having

a. an elongated rod and

b. a coaxial elongated handle,

c. the rod having a flat bit on one end, and

d. the handle having

i. a stub end at which the bit is attached and

ii. a chamvered free end,

e. comprising the steps of:

f. placing a plastic film strip on a surface, then

g. placing the bit of the tool at about the middle of the plastic film strip,

h. depressing the bit on the strip into said surfact, thus

j. causing the plastic film strip to fold up along the sides of the tool, then

k. moving the tool with the strip positioned thereon from said surfact to a B-wire connector, and

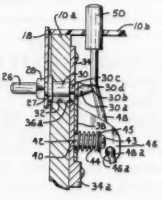
m. inserting the plastic film strip into the B-wire connector.

3,909,937

CAN OPENER HAVING A REMOVABLE HAND LEVER RETAINED BY A HINGED LATCH

Robert E. McLean, Raytown, Mo., assignor to Rival Manufacturing Company, Kansas City, Mo.

Filed Apr. 11, 1974, Ser. No. 459,911
Int. Cl.² B67B *7/38*
U.S. Cl. 30—4 R **10 Claims**



6. In a can opener having an upright frame, a rotary feed wheel and means for rotating said feed wheel, the combination therewith of:

a hand lever;

a pin member extending from said hand lever;

an opening in said frame, said pin member removably insertable in said frame opening and rotatable therein to pivotally mount said hand lever on said frame;

a cutting element carried on said hand lever and movable therewith toward and away from said feed wheel; and

a latch member supported on said frame for movement about a pivot axis substantially perpendicular to the axis of the inserted pin member, said latch member cooperating with said frame opening when in a latching position to engagingly retain the inserted pin member therein, said latch member being slidable upon said frame from said latching position to permit removal of said pin member from said frame opening;

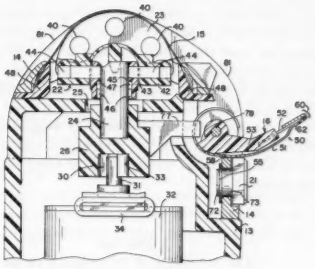
said pin member being selectively movable in said frame opening transversely thereof to engagingly slide said latch member from said latching position.

3,909,938

COMBINED CLOSE SHAVING AND LONG HAIR TRIMMING HEAD ASSEMBLY FOR AN ELECTRIC SHAVER

J. Edward Brenneman, and Nial C. Bartram, both of Lancaster, Pa., assignors to Schick Incorporated, Lancaster, Pa.

Filed July 15, 1974, Ser. No. 488,740
Int. Cl.² B26B *19/10*
U.S. Cl. 30—34.1 **8 Claims**



1. In an electric shaver of the type having a housing, a power driven actuating member contained within said housing, and a cutter head of the close-shaving type including a multi-apertured comb member and a cutter blade reciprocatively driven by said actuating member, an auxiliary trimmer head assembly comprising, in combination:

a trimmer blade assembly including first and second trimmer blades having spaced cutting teeth at one end and arranged for relative reciprocation;

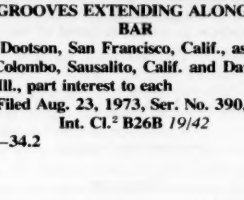
means for pivotally mounting said trimmer blade assembly to said housing whereby said blade assembly is free to pivot between a retracted position, wherein said cutting teeth are disposed in close proximity to said comb member, and an extended position, wherein said cutter teeth project away from said housing; and

actuator means including a curved based portion on said first trimmer blade, a cam track disposed on the surface of said base portion, a cam in operative engagement with said cam track, and means including a user-actuable slide button mounted on the wall of said housing for driving said cam along a path substantially parallel to the pivot axis of said trimmer blade assembly to actuate said trimmer blade assembly into either said retracted or extended position.

3,909,939
SAFETY RAZOR HAVING A ROW OF SHORT CONVERGENTLY SLANTED COUNTER-STRETCHING TENSION GROOVES EXTENDING ALONG THE GUARD BAR

Norman L. Dootson, San Francisco, Calif., assignor to Winifred M. Colombo, Sausalito, Calif. and David V. Dootson, Chicago, Ill., part interest to each

Filed Aug. 23, 1973, Ser. No. 390,933
Int. Cl.[2] B26B *19/42*
U.S. Cl. 30—34.2 1 Claim

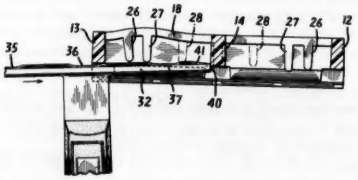


1. In a safety razor including a guard plate, a blade, means mounting the blade on the guard plate, said guard plate comprising a stationary guard bar with longitudinally extending edge surfaces, and a space between one longitudinal edge of the guard bar and the blade forming a rinsing slot, the improvement comprising a plurality of short, narrow, straight counter-stretching tension grooves formed in the surface of the guard bar, the grooves having upper ends terminating adjacent the rinsing slot and lower ends terminating adjacent the other longitudinal edge of the guard bar, each of said grooves is slanted so as to converge toward the ends of its adjacent grooves.

3,909,940
SAFETY RAZOR COMBINATION

Clemens A. Iten, Staunton, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 22, 1973, Ser. No. 390,554
Int. Cl.[2] B26B *21/14*; B25G *3/08*
U.S. Cl. 30—47 5 Claims

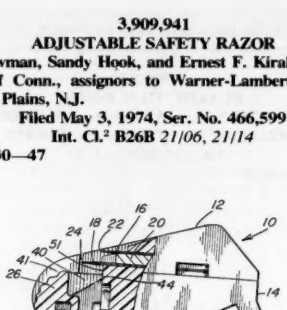


1. In a safety razor combination, a razor head cartridge part and a handle part adapted to be detachably connected thereto, the connection between the parts comprising a dovetail arrangement with an elongated key on the handle part and a complental elongated dovetail slot in the other part, said key having a generally flat head with a depression in the surface and said cartridge including a flexible detent bar exposed at said slot opposite said key with a projecting main lug engageable in said depression and an outer auxiliary lug arranged between said main lug and the entrance into said slot effective to guide the key past said main lug.

3,909,941
ADJUSTABLE SAFETY RAZOR

Peter Bowman, Sandy Hook, and Ernest F. Kiraly, Fairfield, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 3, 1974, Ser. No. 466,599
Int. Cl.[2] B26B *21/06, 21/14*
U.S. Cl. 30—47 2 Claims



1. An adjustable safety razor blade cartridge including means for releasably engaging a holder, said cartridge comprising:

a. a plastic blade seat member,

b. at least one blade positioned on said blade seat member, said at least one blade including a forwardly extending cutting edge,

c. a cap member above said at least one blade, said cap member being permanently connected to said blade seat member to bond said at least one blade between said cap and blade seat members,

d. a transversely elongated plastic guard structure having a skin-engaging surface parallelly spaced forwardly of the cutting edge,

e. a plurality of flexible plastic webs integrally formed with and interconnecting said blade seat member and said guard structure, said webs defining a transverse hinging axis parallel to said skin-engaging surface,

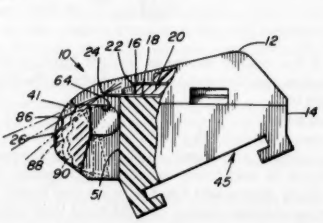
f. a linear channel formed in an underside of said guard structure, said channel being nonparallelly disposed with respect to said hinging axis, and

g. a manually operable cam mounted on said blade seat and movable about a forwardly directed axis, said cam including a portion extending forwardly to beneath said channel and another portion extending upwardly from said forwardly extending portion into and permanently seated in said channel, movement of said cam about said forwardly directed axis adjusts the shaving position of said skin-engaging surface with respect to the cutting edge.

3,909,942
ADJUSTABLE SAFETY RAZOR

John T. Ciaffone, Bridgeport, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 3, 1974, Ser. No. 466,598
Int. Cl.[2] B26B *21/06, 21/14*
U.S. Cl. 30—47 2 Claims



1. An adjustable safety razor blade cartridge including

means for releasably engaging a holder, said cartridge comprising:

a. a plastic blade seat member including a pair of spaced forwardly extending elements, each one of said blade seat elements having an arcuate recess therein,

b. at least one blade positioned on said blade seat member, said at least one blade including a forwardly extending cutting edge,

c. a plastic cap member above said at least one blade and permanently connected to said blade seat member to bond said at least one blade between said cap and blade seat members, said cap member including a pair of spaced forwardly extending elements, each one of said cap elements having an arcuate recess therein, said cap elements being in juxtaposition with said blade seat elements, the arcuate recesses in said cap elements and said blade seat elements form a pair of spaced holes on a transverse axis,

d. a transversely elongated guard structure having a skin-engaging surface parallelly spaced forwardly of the cutting edge, said guard structure including a pair of posts rotatably seated in said spaced holes, said transverse axis being eccentrically positioned with respect to said skin-engaging surface, and

e. manually operable means for selectively rotating said guard structure about said axis to adjust said skin-engaging surface with respect to the cutting edge.

3,909,943

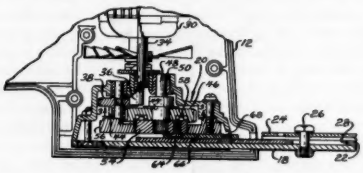
POWERED CUTTER WITH SNUBBER DRIVE MEANS

Jerome Buschman, Jefferson City, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Aug. 19, 1974, Ser. No. 498,412

Int. Cl.[2] B26B *19/02;* **F16D** *3/14*

U.S. Cl. 30—216 **1 Claim**



1. In a powered hedge shear having a stationary blade and a cutting blade supported to move relative to the stationary blade, and linkage means connected between a rotary power shaft and the cutting blade for powering the latter, the improvement being a snubber device in the linkage means and comprising a pair of adjacent members and means for supporting each said member for independent rotation about a common axis through the members, a plurality of boss means on one of the adjacent members located radially of the rotational axis and fitting respectively freely into a corresponding plurality of circumferentially elongated recess means in the adjacent member, a resilient snubber element in each recess means and fitting generally snuggly therein and adapted to be abutted by the boss means upon rotation in the proper direction of the adjacent members relative to one another, said snubber elements each being tubular in configuration and being located with the hollow bore extended in the same direction generally as said rotational axis and said boss means being cylindrical and extending generally in the direction of and lining up circumferentially generally with said hollow bore in the tubular snubber element, the recess means and snubber elements being sized relative to one another to limit free play of the snubber elements in the recess means upon attempted rotation of the members relative to one another, operable for transmitting a torque equal to the energy of compression of the snubber elements and further for reducing shock impact against the moving blade through the linkage means to the rotary shaft by and upon additional compression and distortion of the snubber elements.

3,909,944

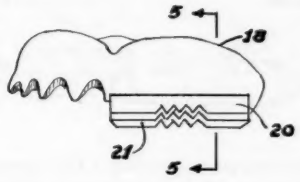
DENTURE AND METHOD OF MAKING THE SAME

James R. Schmidt, 33 Birmingham Drive, Englishtown, N.J. 07726, and Mark E. Franklin, 39 Koster Drive, Freehold, N.J. 07728

Continuation of Ser. No. 311,782, Dec. 4, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,095

Int. Cl.[2] A61C *13/00*

U.S. Cl. 32—2 **7 Claims**



1. An improved unitary solid base of the mass-produced variety in the form of a rough moldable wax-pattern for use in the preparation of a separate, finalized denture having the exacting dimensions of the mouth of a patient,

said wax-pattern having the following characteristics:

A. a wax body consisting structurally in the form of a rough counterpart of a lower denture,

1. said wax-body having inner and outer peripheral sides forming a semi-annular channel consisting structurally in a rough counterpart of the lower mandible ridge of the mouth of said patient,

a. said channel having an exterior base structurally containing a plurality of sockets adapted for the receipt of artificial teeth, and

b. each of said sockets having a periphery consisting structurally in a rough counterpart of the attached and unattached gingival tissues of the gum of said patient.

3,909,945

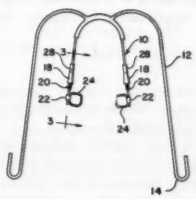
EXTRA ORAL ARCH SPRING FORCE

David Foxman, 333 Gribbel Road, Wyncote, Pa. 19095

Filed June 11, 1974, Ser. No. 478,372

Int. Cl.[2] A61C *7/00*

U.S. Cl. 32—14 D **8 Claims**



1. In an extra oral arch spring force for use with an extra oral arch wire, in moving a tooth, the combination of

A. a socket associated with the extra oral arch wire,

1. said socket having a cylindrical portion in contact with the extra oral arch wire,

2. the inside diameter of the cylindrical portion being the same as the outside diameter of the wire whereby the socket is in tight, sliding engagement over the wire;

B. a spring retained on the extra oral arch wire,

1. said spring having a first end and a second end,

2. said first end contacting the said socket and the second end being biased in the direction of the tooth; and

c. means to retain the first end of the spring in contact with the socket,

1. the said means being integral with the socket.

3,909,946

DENTAL HANDPIECE

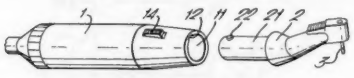
Yoshiaki Watanabe, Kyoto, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Nov. 2, 1972, Ser. No. 303,126

Claims priority, application Japan, Nov. 9, 1971, 46-104808[U]

Int. Cl. A61c *1/08*

U.S. Cl. 32—26 **13 Claims**



1. A dental handpiece comprising: a body portion and a forward end portion detachably connected to said body portion; said body portion being provided with an axial bore which opens at the forward end of said body portion, an axial slot formed in the inner surface of said bore, a lateral recess formed in said slot and a slide key in said slot normally urged to a position to close said recess, said slide key being normally urged by a spring to said recess closing position and being movable out of said position against the force of spring to a recess opening position: and said forward end portion having means for supporting a rotary dental tool and a shaft removably inserted into said axial bore of said body portion and being provided with a pin slidably engageable in said slot in said axial bore when said shaft is inserted into said axial bore so that said pin pushes said key out of said recess closing position and, upon relative rotation of said forward end portion to said body portion, engages in said recess, whereupon said key is restored to said original recess closing position and said pin and thereby said forward end portion are securely connected with said body portion so as to prevent relative axial and rotative movement therebetween.

3,909,947

METHOD AND APPARATUS FOR ENLARGING PATTERNS

Volkmar H. Voth, Seulberg, Taunus, and Heimo Plumpe, Darmstadt, both of Germany, assignors to Texography-Vertrieb Volkmar H. Voth KG, Seulberg, Germany

Filed Apr. 20, 1973, Ser. No. 353,197

Claims priority, application Germany, Apr. 19, 1972, 2219076

Int. Cl.[2] B43L *13/10*

U.S. Cl. 33—23 G **10 Claims**

1. A process for varying the sizes of patterns, starting with a model in a basic size, on which a plurality of principal points are marked and a plurality of incremental values along a selected coordinate system and are assigned to each principal point, and wherein each incremental value assigned to a principal point indicates the distance of the shift by which the said principal point must be shifted in a selected direction during the transfer from the basic to the final size, comprising the steps of

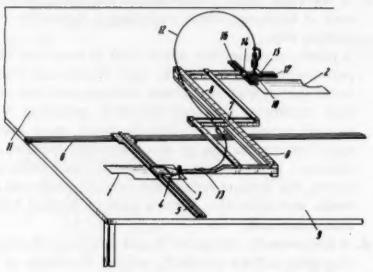
a. tracing the model with a scanner,

b. generating signals which are proportionate to the instantaneous position of the scanner with respect to each axis of the selected coordinate system,

c. generating at least one distance signal, said distance signal being a function of the instantaneous distance of the scanner from the last passed principal point along at least one coordinate axis,

d. generating control signals which are proportionate to the instantaneous value of the said distance signal and proportionate to the difference of the incremental values along each axis of the said coordinate systems between two adjacent principal points,

e. controlling a follow-on point means which draws or cuts the varied size pattern,



f. the step of controlling the follow-on point means comprising controlling the follow-on point means along a duplicating path which corresponds to a movement proportionate with the scanner and simultaneously controlling instantaneous deviations of the follow-on point means from the duplication path by and proportional to the said control signals.

3,909,948

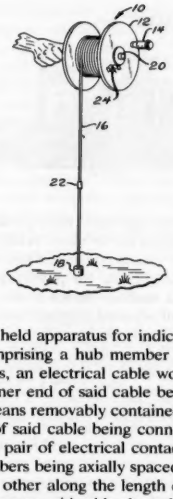
ELECTRONIC WATER LEVEL INDICATOR

Reinhold S. Markfelt, Minneapolis, Minn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 4, 1974, Ser. No. 439,492

Int. Cl.[2] G01F *23/04*

U.S. Cl. 33—126.5 **5 Claims**



1. Portable, hand held apparatus for indicating the level of water in a well comprising a hub member having a pair of spaced radial flanges, an electrical cable wound around said hub member, the inner end of said cable being connected to electronic circuit means removably contained within said hub and the outer end of said cable being connected to a probe member including a pair of electrical contact members, said pair of contact members being axially spaced and electrically insulated from each other along the length of the cable, distance measuring means on said cable along the length thereof, a pair of handles mounted on said flanges at opposite ends of said hub member for reeling and unreeling the cable on said hub member, a signal device connected to said electronic circuit means and removably mounted at least partially within said hub, and battery means removably mounted within said hub for providing power to said signal device when said electronic circuit means is energized by the presence of a water path between said pair of contact members, said electronic circuit means, said battery means and said signal device all being mounted on a support member which includes fastening means for locking it into an axial opening in said hub.

3,909,949

FISHING LINE LENGTH INDICATOR MEANS

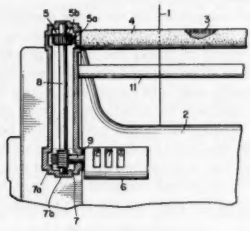
Toshiaki Miyamae, 16, 2-Ban, 2-Chome, Nishi-Iwata, Higashi-Osaka, Osaka, Japan

Filed Aug. 30, 1973, Ser. No. 393,062

Claims priority, application Japan, Sept. 22, 1972, 47-110440

Int. Cl.[2] G01B 5/04, 3/12

U.S. Cl. 33—129 2 Claims



1. A fishing line length indicating device comprising a casing including a pair of spaced drum shaped end faces, a spool rotatably mounted on said casing and extending between said drum shaped end faces, said spool arranged to wind a fishing line thereon, a first shaft rotatably mounted on the radially outer edges of said drum faces and disposed in parallel relation with the axis of rotation of said spool so that said first shaft is spaced radially outwardly from the surface on said spool on which the fishing line is wound with the circumferential surface of said first shaft located opposite the circumferential surface of said spool on which the fishing line is wound so that the fishing line being wound on said spool passes over the circumferential surface of said first shaft, a resilient cylinder covering the circumferential surface of said first shaft and having a rough outer circumferential surface, a second shaft rigidly fixed to said casing and disposed in generally parallel relation with said first shaft and located radially inwardly from said first shaft toward said spool, the axis of said second shaft being located approximately in the plane passing through the axes of rotation of said spool and said first shaft so that the fishing line being wound on said spool passes over and in contact with said second shaft so that the fishing line is biased by its contact with said second shaft into positive contact with the rough outer circumferential surface on said resilient cylinder covering said first shaft, and means mounted on said casing and operatively connected to said first shaft for providing a visual indication of the actual underwater length of the fishing line unwound from said spool.

3,909,950

INSIDE GAUGE OF THE TYPE HAVING MOVING ARMS AND DIRECT CONTACT FEELERS USED TO CHECK THE SIZES OF MECHANICAL WORKPIECES DURING THEIR MACHINING ON MACHINE TOOLS

Mario Possati, Bologna, Italy, assignor to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy

Filed Nov. 6, 1973, Ser. No. 413,231

Claims priority, application Italy, Nov. 13, 1972, 3585/72

Int. Cl.[2] G01B 5/02, 5/08; B23Q 15/00

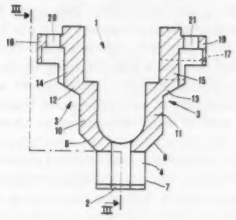
U.S. Cl. 33—143 R 7 Claims

1. In a machine tool for machining an internal surface of a bored workpiece comprising:

a workhead adapted to support the workpiece, said workhead having an opening extending toward the workpiece and in communication with the bore of said workpiece through which flows a cooling fluid, flowing towards the workpiece; a toolhead carrying a tool, said toolhead being movable relative to said workhead axially thereof for the entrance of the tool, from a side of the workpiece, into the same; and

an interior gauge having a gauge head which supports reciprocally movable arms oriented generally parallel to the axis of said bore and carrying feelers adapted to contact the internal surface of the workpiece for checking the internal size thereof, said gauge being located in said workhead and being carried by means for moving said gauge relative to the workpiece axially thereof for the entrance of said feelers into the workpiece from the opposite side of said tool;

the improvement comprising:



a mechanical protection device supported by said gauge head and including first frontal protection means including a protection surface facing said tool and second lateral protection means, said first protection means defining grooves for housing the ends of said arms, said second protection means including elongated protection elements symmetrically located with respect to the grooves of said first protection means and defining an open space for allowing the movements of said arms, said elongated protection elements being connected with said first protection means and with the gauge head, and said second protection means defining openings to permit mechanical adjustment of said movable arms, whereby the protection device protects the gauge head and the feelers and allows the flow of cooling fluid through said workhead.

3,909,951

INTERNAL MEASURING APPARATUS

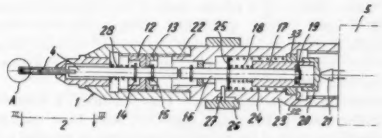
Johann Meier, Minusio, Switzerland, assignor to Premisura AG Instrumente fur Prazisions-Messung, Solothurn, Switzerland

Filed July 17, 1972, Ser. No. 272,143

Claims priority, application Switzerland, July 16, 1971, 11080/71

Int. Cl.[2] G01B 5/12

U.S. Cl. 33—178 R 4 Claims



1. A probe for use with internal measurement apparatus comprising at least two balls housed in a radially displaceable manner within a casing, said casing being provided with an axially displaceable pin including oblique surfaces at one end thereof in contact respectively with said balls for converting radial movement of said balls into axial displacement of said pin and vice versa, rolling surfaces for said balls extending perpendicular to the axis of said pin being formed by a flat surface of a terminal member permanently secured to the end of said casing, said rolling surfaces lying in the same plane as the dividing surface located between said terminal member

and said casing such that no part of said terminal member projects in an axial direction over said rolling surfaces in the direction of said casing thereby bringing said rolling surfaces exactly into a joint plane, the diameter of said balls and the bore of said casing which receives said pin being so dimensioned that upon removal of said pin from the bore in said casing said balls can be introduced through said bore into ball guides located within said casing thereby making possible introduction of the balls after securing said terminal member to the end of said casing or to exchange the balls in the event of damage thereto, said pin being further provided with axially spaced stop members cooperative respectively with axially spaced stop surfaces located internally of said casing for limiting displacement of said pin in one direction such that the said oblique surfaces on said pin cannot disengage from said balls and also for limiting displacement of said pin in the opposite direction such as to prevent said balls from being pressed out of said ball guides beyond a ball-retaining lip provided on said casing, a displacement member mounted in said casing for actuation longitudinally of said casing and which is coupled to said pin, one end of said displacement member being in contact with a linking means of an apparatus for measuring the displacement of said pin, and resilient means interposed in said coupling between said pin and displacement member and which serves to permit relative movement therebetween whenever a specific force acting upon said pin is exceeded.

3,909,952

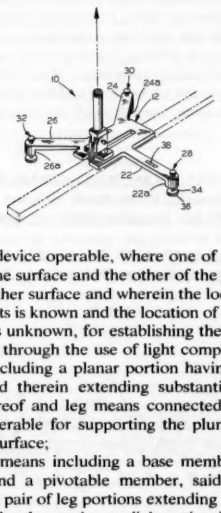
PLUMB LIGHT

Guy Lagasse, 94 Bush Hill Rd., Manchester, Conn. 06040

Filed Apr. 29, 1974, Ser. No. 465,320

Int. Cl.[2] G01C *15/00, 15/10, 15/02*

U.S. Cl. 33—227 **7 Claims**



1. A plumb device operable, where one of a pair of points is located on one surface and the other of the pair of points is located on another surface and wherein the location of one of the pair of points is known and the location of the other of the pair of points is unknown, for establishing the location of the unknown point through the use of light comprising:

a. a frame including a planar portion having an elongated slot formed therein extending substantially the entire length thereof and leg means connected to said planar portion operable for supporting the plumb device on a floor-like surface;

b. mounting means including a base member, a rotatable member and a pivotable member, said base member including a pair of leg portions extending in parallel relation to each other and a medial portion interconnecting said pair of leg portions substantially at the mid point thereof to form a pair of slots extending between said pair of leg portions and located on either side of said medial portion thereby providing said base member with a generally H-shaped configuration, said base member being mounted on said planar portion of said frame for sliding movement relative thereto with said medial portion of said base member received within said elongated slot of said planar portion of said frame and with one of said pair of leg portions of said base member located in juxtaposed relation to said planar portion on one side thereof and with the other of said pair of leg portions of said base member located in juxtaposed relation to said planar portion on the other side thereof, said rotatable member being mounted on said base member for rotation through 360° about a vertical axis passing through the center of said rotatable member, said pivotable member being pivotably supported on said rotatable member for selectively positioning said pivotable member relative to said rotatable member at any angle between 0° and 90° measured relative to said vertical axis passing through the center of said rotatable member;

c. index means supported on said base member in depending relation therefrom operable for marking on one surface the position of one of the pair of points; and

d. light means mounted on said pivotable member for movement therewith, said light means including a light producing source operable for producing a beam of light and a cross hair positioned in the path of the beam of light produced by said light producing source so that an image of said cross hair is projected on another surface with the center of the projected image of said cross hair marking the location of the other of the pair of points.

3,909,953

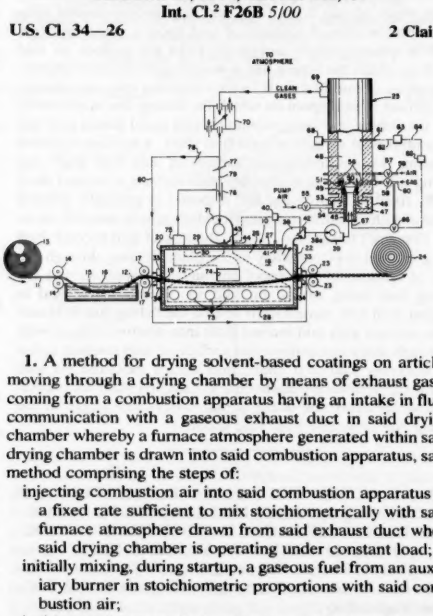
PAINT DRYING METHOD AND APPARATUS

Klaus H. Hemsath; Arvind C. Thekdi, both of Sylvania, Ohio, and Frank J. Vereecke, Palmyra, Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Feb. 28, 1974, Ser. No. 446,737

Int. Cl.[2] F26B *5/00*

U.S. Cl. 34—26 **2 Claims**



1. A method for drying solvent-based coatings on articles moving through a drying chamber by means of exhaust gases coming from a combustion apparatus having an intake in fluid communication with a gaseous exhaust duct in said drying chamber whereby a furnace atmosphere generated within said drying chamber is drawn into said combustion apparatus, said method comprising the steps of:

injecting combustion air into said combustion apparatus at a fixed rate sufficient to mix stoichiometrically with said furnace atmosphere drawn from said exhaust duct when said drying chamber is operating under constant load;

initially mixing, during startup, a gaseous fuel from an auxiliary burner in stoichiometric proportions with said combustion air;

igniting said gaseous fuel and said combustion air in said combustion apparatus by means of at least one pilot burner to produce an inert type gas mixture possessing not more than five percent oxygen by content;

circulating at least a portion of said inert gas mixture leaving said combustion apparatus through a heat exchange mechanism to cool same to a predetermined value;

piping at least a portion of said inert gas mixture leaving said cooling mechanism into said drying chamber to purge same;

introducing said articles through an article inlet end into said drying chamber to produce a furnace atmosphere

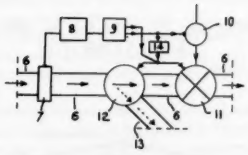
containing solvent emissions and removing said articles through an article outlet end of said chamber;
continuously removing a first portion of said furnace atmosphere through said exhaust duct and burning said removed solvents in said combustion apparatus to continuously produce an inert type off-gas;
sensing the temperature of said off-gas to regulate the flow of fuel to said auxiliary burner to insure that said off-gas possesses no more than five percent oxygen by content;
circulating a portion of said off-gas through said heat exchange mechanism to cool same to a predetermined temperature;
introducing a portion of said cooled off-gas to said drying chamber to insure that said furnace atmosphere is outside the explosive range;
exhausting a second portion of said furnace atmosphere from said drying chamber through a vent;
recirculating said second portion of said furnace atmosphere into said drying chamber after mixing same with said portion of inert type off-gas being circulated into said drying chamber;
controlling the flow of said off-gas to produce a slight overpressure in said drying chamber;
circulating a portion of said inert type off-gas downstream from said heat exchange mechanism into a plenum arrangement at said article inlet end and said article outlet end; and
ejecting said inert type gas mixture from said plenum arrangement in a plurality of gaseous streams directed generally normal to the flow of said articles at a pressure sufficient to establish gas flow patterns through said article inlet and outlet ends whereby said overpressure is maintained and said furnace atmosphere is substantially sealed.

3,909,954

DEVICE FOR PREVENTION AND PROTECTION AGAINST FIRE AND EXPLOSION IN THE LINES OF THE TREATMENT OF INFLAMMABLE COMMINUTED PRODUCTS

Marc K. Zoukourian, 8 impasse Truillot, 94200 Ivry sur Seine, France

Filed Apr. 3, 1974, Ser. No. 457,642
Int. Cl.[2] F26B *13/10*
U.S. Cl. 34—44 **16 Claims**



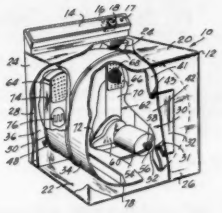
1. A device for prevention and protection against fire and explosion in a line of treatment of inflammable comminuted products, particularly in a line adapted for dry treatment of ligneous fibers or the like comprising: at least, one detector receiving the infra-red radiation emitted in a section of the line by the products circulating in this line; first means sensitive to the level and the duration of the said radiation received by the said detector and converting into alarm signals the said level and duration when they exceed a fixed limit; and second means of intervention controlled by the said alarm signals and causing, in relation to the said level and duration, the injection of a cooling fluid into at least a portion of the line whereby there is achieved the neutralization of a fire or explosion hazard inherent in a sensed condition.

3,909,955

PHASE SHIFT TO PREVENT RELAY CONTACT EROSION IN A CLOTHES DRYER

Donald Edward Janke, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 3, 1973, Ser. No. 421,118
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—45 **5 Claims**



1. A clothes dryer comprising:
means including a drum forming a laundry treatment zone for receiving clothes to be dried;
a drive motor for rotating said drum;
control means for controlling treating of the clothes within the treatment zone;
said control means including a circuit having a relay provided with contacts which are operable to connect said control means to and disconnect said control means from an A.C. electrical power supply,
and a digital control circuit including
clock means for deriving an alternating square pulse waveform from the A.C. waveform of the A.C. electrical supply,
program means including a relay control circuit connected to said relay, said program means being clocked by one polarity of the square pulse waveform for operating said relay in a prescribed sequence,
phase shifting means, including means operable to effect a 180° phase shift, connected to said program means for shifting the phase of the squared waveform in response to operation of said relay to cause each opening of said relay contacts to occur during a polarity of the A.C. supply waveform that is opposite to the polarity of the A.C. supply waveform during the last previous opening, and reset means connected to said phase shifting means for resetting said phase shifting means to an initial state whenever power from said A.C. electrical supply is removed and reapplied to said digital control circuit, an EXCLUSIVE OR gate having a pair of inputs and an output, one of said inputs being connected to receive the squared waveform from said clock means, and means connected between said relay control circuit and the other input of said EXCLUSIVE OR gate for providing said EXCLUSIVE OR gate with a signal each time said relay is operated for causing a 180° phase shift of the square waveform.

3,909,956

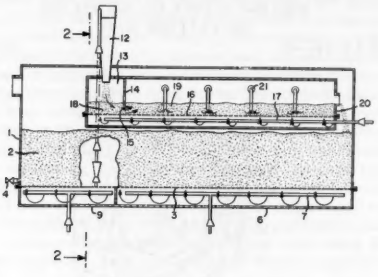
DEVICE FOR PRODUCING A CONSTANT-LEVEL FLUIDIZED BED OF PULVERULENT OR GRANULAR PRODUCTS

Roger Bois, La Celle Saint-Cloud, France, assignor to Drysys Equipment S.A., France

Filed Nov. 30, 1973, Ser. No. 420,462
Claims priority, application France, Jan. 25, 1973, 73.02578
Int. Cl. F26b *17/10*
U.S. Cl. 34—57 R **6 Claims**

1. A device for producing a constantlevel fluidized bed of pulverulent or granular product comprising a product storage tank, first means for fluidizing the product in the tank, first

means for taking-off the fluidized product from said storage tank, a tank regulating the concentration of the pulverulent product, said regulating tank being provided with second product fluidizing means, second product take-off means



connected to said regulating tank and capable of being connected to projecting devices, said regulating tank being connected to the storage tank through the first take-off means, and overflow means adapted to govern the level of the product in the regulating tank and capable of allowing the overflow product to return to the storage tank.

3,909,957

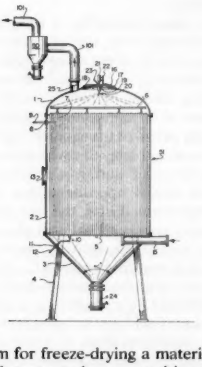
APPARATUS FOR FREEZE-DRYING

Arjun Dev Passey, P.O. Box 1066 154 Green St., Lunenburg, Nova Scotia, Canada

Continuation-in-part of Ser. No. 162,607, July 14, 1971, abandoned. This application July 15, 1974, Ser. No. 488,804

Int. Cl.[2] F26B *13/30*

U.S. Cl. 34—92 **22 Claims**



1. A drying system for freeze-drying a material, said material comprising a substance to be removed in order to effect freeze-drying of said material, which system substantially eliminates the need to supply heat from an external heat source for freeze-drying said material; said system comprising in combination:

a. a drying chamber wherein is maintained a subatmospheric vapor pressure in order to effect freeze-drying of said material,

b. a means for passing said material through said drying chamber for freeze-drying thereof during said passage,

c. an evacuation means for continuously removing vapor from said drying chamber as it is generated in said chamber in the freeze-drying of said material, said evacuation means comprising a combination of coacting means including an absorber wherein the vapor of said substance is absorbed in a liquid absorbent medium passing therethrough, an evaporator in which the substance so absorbed is continuously evaporated from said absorbent medium by heat exchange with a condensing first refrigerant, a condenser in which the vapor of said substance evaporated from said absorbent medium in said evaporator is condensed by heat exchange with evaporating first refrigerant, a first heat pump means adapted for supplying heat recovered from vapor of said substance condensing in said condenser to said evaporator in order to maintain therein the evaporation of absorbed substance from said absorbent medium thereby eliminating the need to supply heat from an external heat source by compressing at least a portion of the vapor of said first refrigerant evaporating in said condenser and supplying the first refrigerant vapor so compressed to said evaporator wherein it condenses in order to maintain therein the aforesaid evaporation of said absorbed substance from said absorbent medium and by expanding condensed first refrigerant from said evaporator through an expansion valve into said condenser, said first heat pump means being equipped with a cooling means for removing excess heat from said first refrigerant in order to maintain heat balance in said evaporator and in said condenser, a chiller in which the absorbent medium passing therethrough is cooled to restore the absorbent medium to the proper temperature for said absorber for passage to said absorber, by heat exchange with an evaporating second refrigerant, a means to maintain the absorbent medium in circulation through said absorber, evaporator and chiller, a pipeline for passing said vapor from said evaporator to said condenser, and including a means to purge the non-condensible gases from the system,

d. a second heat pump means adapted for supplying heat recovered from absorbent medium passing through said chiller to a heat exchange means for supplying heat to effect freeze-drying of said material in said drying chamber thereby eliminating the need to supply heat from an external heat source by compressing at least a portion of the vapor of said second refrigerant evaporating in said chiller and supplying the second refrigerant vapor so compressed to said heat exchange means wherein it condenses thereby supplying heat for effecting freeze-drying of said material and by expanding condensed second refrigerant from said heat exchange means through an expansion valve into said chiller, said second heat pump means including a cooling means for removing excess heat from said second refrigerant in order to maintain heat balance in said heat exchange means and in said chiller.

3,909,958

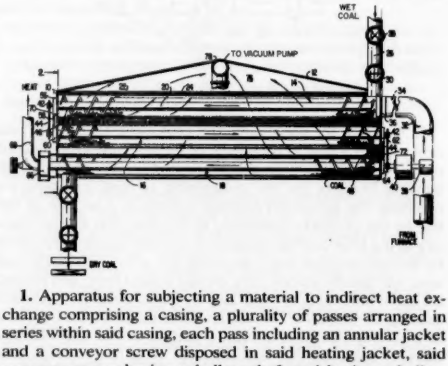
MULTIPLE PASS DRYING APPARATUS

Alder F. Castanoli, 1424 Fifteenth St., Huntington, W. Va. 25701

Filed Sept. 27, 1974, Ser. No. 509,826

Int. Cl.[2] F26B *17/12*

U.S. Cl. 34—166 **8 Claims**



1. Apparatus for subjecting a material to indirect heat exchange comprising a casing, a plurality of passes arranged in series within said casing, each pass including an annular jacket and a conveyor screw disposed in said heating jacket, said conveyor screw having a hollow shaft and having a hollow

screw flight, means for introducing a material to be treated into an annulus provided between the jacket and conveyor screw of a first pass, conduit means for discharging the material from the end of one pass to the beginning of the next pass, means for discharging treated material from said casing, means for introducing a heat exchange medium into the jacket and into the conveyor shaft and screw flight of one of said passes, connecting means for passing the heat exchange medium from one pass to the next, said jackets being provided with aperture means for the passage of vapor which may emanate from the material being treated radially outwardly through said jackets into said casing, said aperture means being defined by a plurality of small passageways spaced along the lengths of said jackets and being of a size to allow moisture passage with substantially no passage of particles of the material being dried, and means for maintaining a vacuum in said casing to exhaust said vapor from said casing.

3,909,959

APPARATUS FOR PLAYING AN EDUCATIONAL GAME INCLUDING AUTOMATIC VERIFICATION MEANS

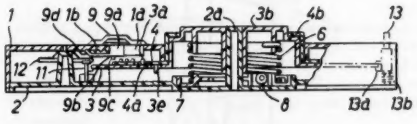
Walter Hesener, 66 rue de la Prulay, 1217 Meyrin, Geneva, Switzerland

Division of Ser. No. 129,469, March 30, 1971, Pat. No. 3,780,453. This application July 25, 1973, Ser. No. 382,501

Claims priority, application Switzerland, Mar. 31, 1970, 4696/70; Mar. 29, 1970, 8136/70; Sept. 5, 1970, 13300/70; Nov. 20, 1970, 17285/70; Nov. 30, 1970, 17659/70The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.

Int. Cl. G09b *3/00*

U.S. Cl. 35—48 R **6 Claims**



1. Apparatus for playing an educational game conprising:

a housing;

a code bearing means supported by and at least partly concealed in said housing and adapted for movement relative to at least one part of the housing;

a plurality of code means on said code bearing means;

biassing means in said housing for biassing said code bearing means to move automatically in a predetermined direction; and

a plurality of setting means connected to said one part of the housing and constructed to be operable from outside the housing, each of said plurality of setting means for movement into any one of at least two possible answer positions, each of said possible answer positions corresponding to one of several possible answers to a given question and one of said possible answers being a correct answer, each said setting means having means thereon which carry out a movement in a direction different from said predetermined direction when the position of said setting means is changed and which co-operate with said plurality of code means on the code bearing means to prevent said code bearing means from moving in said predetermined direction when any setting means is moved to a position corresponding to an incorrect answer, and to permit said code bearing means to move in said predetermined direction when a predetermined number of said setting means are moved to respective positions corresponding to correct answers.

3,909,960

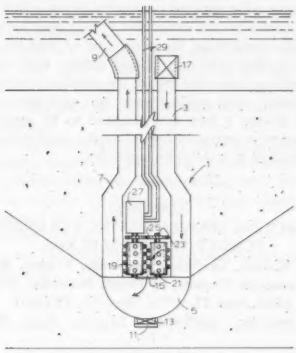
LOOSE MATERIAL RECOVERY SYSTEM HAVING A MIXING BOX

Frederick M. Casciano, Honolulu, Hawaii, assignor to University of Hawaii, Honolulu, Hawaii

Filed May 29, 1973, Ser. No. 364,870

Int. Cl.² E02F *3/92*

U.S. Cl. 37—63 **11 Claims**



6. Loose material recovery apparatus comprising a mixing box, a loose material opening in the mixing box, a fluid supply inlet opening along one side of the box and a slurry outlet opening in another portion of the box, means for flowing fluid into the fluid inlet opening, and means for withdrawing slurry of the fluid and loose material through the slurry outlet opening, wherein the mixing box comprises a box having a semicircular bottom and a relatively flat elongated top, wherein the loose material opening is positioned medially between longitudinal extremities of the top and wherein the fluid supply and slurry openings are positioned in the top at longitudinal extremities thereof on opposite sides of the loose material opening, and further comprising a water supply inlet pipe connected to the fluid supply opening and extending upward therefrom, a slurry suction pipe connected to the slurry outlet opening and extending upward therefrom generally parallel to the water supply pipe, and means for attaching a flexible suction hose to an upper distal end of the slurry pipe.

3,909,961

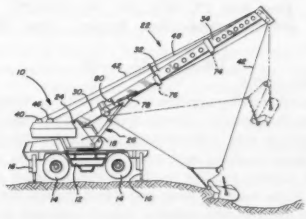
DRAGLINE ARRANGEMENT FOR TELESCOPIC HYDRAULIC CRANE

Gerald P. Lamer, and Ronald D. Seeley, both of Rothschild, Wis., assignors to J. I. Case Company, Racine, Wis.

Filed May 21, 1974, Ser. No. 471,864

Int. Cl.² E02F *3/48*

U.S. Cl. 37—116 **5 Claims**



1. In a vehicle having turntable rotatable about a vertical axis on a base and a multipurpose crane boom pivoted about a horizontal pivot axis on said turntable, said crane boom

having at least three boom sections, said boom sections including at least a base section pivoted on said horizontal pivot, an outer end section telescoped relative to said base section, and an intermediate section between said base section and said outer end section, said outer end section having a plurality of pulleys rotatable on a free end thereof, a pair of cables entrained over respective ones of said pulleys, and means for winding and unwinding said cables, the improvement of a sheave, support means on said base section rotatably supporting said sheave adjacent said horizontal pivot, a first guide for one of said cables on the outer end of said base section and a second guide member on the outer end of said intermediate section for guiding said one of said cables, said one of said cables extending from said means for winding and unwinding over said pulley, said guide means and said sheave, respectively, and having a free end adapted to be attached to a dragline bucket so that said cables can be used to support and operate a bucket in a dragline operation.

3,909,962

BACK-ACTING SHOVEL HAVING COOPERATING TURRET MOUNTED BLADE

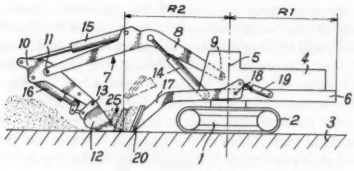
Gabriel L. Guinot, Le Plessis Belleville, France, assignor to Societe Anonyme Poclain, Le Plessis Belleville, France

Filed June 27, 1974, Ser. No. 483,807

Claims priority, application France, June 29, 1973, 73.23889

Int. Cl.[2] E02F *3/32*

U.S. Cl. 37—117.5 **6 Claims**



1. An earth moving appliance comprising a frame; displacement means for moving the frame; turret means mounted on the frame for rotation relative thereto; a working attachment mounted on said turret means and including a working tool; an arm mounted on the turret means; a blade means mounted on said arm; and means for altering the position of said arm, so that in one position the blade means will bear against the ground, the blade means extending transversely to a plane of movement of the working attachment and being disposed between the working tool and the frame.

3,909,963

BACK-ACTING SHOVEL WITH COOPERATING SHIELD

Jean E. Patel, Le Plessis Belleville, France, assignor to Poclain, S.A., Belleville, France

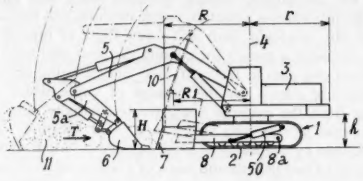
Filed June 27, 1974, Ser. No. 483,675

Claims priority, application France, June 28, 1973, 73.23786

Int. Cl.[2] E02F *3/32*

U.S. Cl. 37—117.5 **6 Claims**

1. An earth moving appliance comprising: a chassis; means for moving the chassis; a turret mounted for rotation on the chassis about an axis; a jib pivotally mounted on the said turret and carrying a working tool, each of the positions which the turret can assume relative to the chassis defining a working direction of the working tool; and shield means connected to the chassis and movable relative thereto between a first position in which the shield means bears against the ground and is disposed between the working tool and the chassis, and a second position in which the shield means is raised from the ground, the shield means being curved and having a centre of curvature which is substantially on the axis of rotation of the turret, the radius of curvature of the shield means being such that contact between the shield means and the turret on rotation of the latter is avoided, the shield means, when in the first position, presenting a stop surface to the working tool at least in a number of said working directions thereof.



3,909,964

APPARATUS FOR SPREADING AND FEEDING PIECES OF WASHING

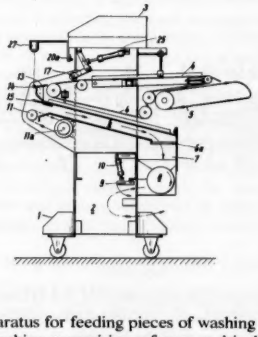
Rolf Wenck, Geesthacht, Germany, assignor to E. & E. Peters Inh, Ludwig Mohr, Hamburg, Germany

Filed Aug. 30, 1974, Ser. No. 501,984

Claims priority, application Germany, Apr. 26, 1974, 2420318

Int. Cl.[2] D06F *67/04*

U.S. Cl. 38—143 **28 Claims**



1. An apparatus for feeding pieces of washing to a washing treatment machine comprising a frame, a drivable feed conveyor positioned on said frame, a freely rotatable pressure roller positioned above said feed conveyor, a suction channel positioned below said feed conveyor, a vacuum means connected to said channel whereby a piece of washing can be sucked to stretch it out, and a device connected to the frame which on contact with a piece of washing generates such a resistance to movement of the piece of washing that a piece of washing located with its front end laid on to the feed conveyor and with its rear end in the suction channel does not move.

3,909,965

DISPLAY APPARATUS

Peter Johan Torsten Tornqvist, and Gustaf Shiro Gadelius, both of Lidingo, Sweden, assignors to AB X-Panding Products, Lidingo, Sweden

Filed Mar. 11, 1974, Ser. No. 450,192

Claims priority, application Sweden, Mar. 14, 1973, 7303560

Int. Cl.[2] B09F *11/28*

U.S. Cl. 40—32 **9 Claims**

1. Display apparatus for a number of flexible sheets in-

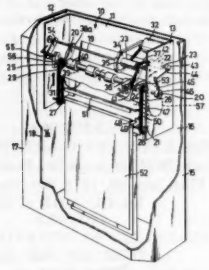
tended to be displayed sequentially and with the sheets vertically suspended, comprising:

the upper edge of each sheet being attached to a respective holder;

a vertically oriented endless conveyor means having a forward facing, upwardly moving side, and a rearward facing downwardly moving side; an upper return portion near the top of said conveyor means, over which said upper return portion the sheets and their said holders pass; a lower return portion near the bottom of said conveyor means; means for moving said conveyor means, and hence said sheet at a first rate;

a plurality of said holders, one for supporting each said sheet, each said holder extending across and being supported on said conveyor means and said holders being spaced apart around said conveyor means;

sheet feed roller means; means supporting said sheet feed roller means in opposed relationship to said upper return portion and outside the pathway of said conveyor means for sequential engagement with each said sheet;



shifting means providing intermittent contact between said sheet feed roller means and said upper return portion, when shifted toward said upper return portion, said feed roller being shaped, adapted and positioned to trap a sheet between said feed roller and said upper return portion;

means for rotating said sheet feed roller means so that, upon engagement with a sheet, the sheet feed roller means moves an engaged sheet in the direction toward said conveyor means rearward facing portion at a second rate, greater than said first rate

synchronizing means for synchronizing action of said conveyor moving means and said feed roller shifting means, so that said feed roller first moves toward and engages a sheet only when that sheet upper edge is at said upper return portion and said feed roller remains in engagement with that sheet so that the downwardly hanging portion of that sheet at the forward portion of said conveyor is rapidly fed up between said feed roller and said return portion and is transferred to a downwardly hanging position, rearwardly of said conveyor.

3,909,966

OPERATING DEVICE FOR PERPETUAL CALENDAR

Reiji Sato, Yokohama, Japan, assignor to Amano Corporation, Yokohama, Japan

Filed Dec. 28, 1973, Ser. No. 429,383

Int. Cl.[2] G09D *3/00*

U.S. Cl. 40—107 **4 Claims**

1. An operating mechanism for a perpetual calendar comprising:

a. a date wheel (**8**) having a circumferential face,

1. 31 equal sections of said face being associated with 31 days of a month respectively,

2. 30 of said sections (**8′**) being of a common radius, and the section (**8***a*) associated with the 31st day of the month being of a smaller radius;

b. a month wheel (**7**) coaxial with said date wheel and having a circumferential face,

1. twelve equal sections of said face being associated with the twelve months of the year respectively,

2. the sections (**7′**) of the face of said month wheel associated with the months having 31 days being of said common radius, and the sections (**7***a*) associated with the months having 30 days being of a smaller radius,

3. said sections of smaller radius constituting radial notches in said faces of said date wheel and said month wheel respectively;

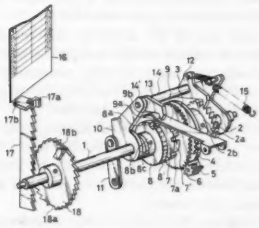
c. transmission means (**4, 5, 6**) operatively interposed between said wheels and angularly advancing said month wheel by one section of said face thereof in response to angular advance of said date wheel by said 31 sections of the latter;

d. actuating means for cyclically advancing said date wheel in angular steps, said actuating means including

1. a ratchet wheel (**2**) connected to said date wheel for joint rotation about the common axis of said date wheel and said month wheel,

2. a support (**10**),

3. means (**11**) for pivoting said support about said common axis,



4. a driving pawl (**12**) movably mounted on said support and drivingly engaging said ratchet wheel during said cyclic advancing; and

e. control means for sensing the respective radii of axially aligned sections of said faces and operatively connected to said actuating means for advancing of said date wheel in a step corresponding to one section of said date wheel when at least one of said sensed aligned sections is of said common radius, and for causing advancing of said date wheel in a step corresponding to two sections of said date wheel when the sensed aligned sections are notches by varying the effective stroke of said driving pawl, said control means including

1. a control arm (**9**) having a sensing portion (**9***a*) and a cam portion (**9***b*) and movably mounted for simultaneous engagement of said sensing portion with said faces,

2. means (**15**) biasing said control member to move toward said common axis when said sensing portion simultaneously engages notches in said faces,

3. an engaging member (**13**) connected to said driving pawl for joint movement therewith relative to said support, said engaging member engaging said cam portion for moving said driving pawl of said support in response to the position of the engaged control member relative to said common axis between respective positions of different effective stroke.

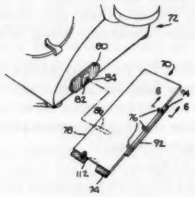
3,909,967
TELEPHONE INDEX DEVICES

James P. Foley, Crest Road, Katonah, N.Y. 10536

Division of Ser. No. 233,480, March 10, 1972, which is a continuation-in-part of Ser. No. 116,384, Feb. 18, 1971, which is a continuation-in-part of Ser. No. 8,660, Feb. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 837,405, June 30, 1969. This application Mar. 12, 1974, Ser. No. 450,476

Int. Cl.[2] G09F *3/00*

U.S. Cl. 40—336 2 Claims



1. A telephone index device comprising:
a flat, slab-like base member for supporting a stack of index sheets on the upper surface thereof,
mounting means for mounting said base member on a generally vertical surface of a telephone instrument comprising a mounting plate member,
adhesive means for securing said mounting plate to said vertical surface of said telephone instrument,
a cylindrical plug extending outwardly from one of said members, the axis of said plug being generally parallel to the plane of said base member,
a corresponding cylindrical socket in the other of said members and adapted to receive and frictionally grip the extended portion of said plug to thereby maintain said base member in the desired position relative to said telephone instrument,
said plug and said socket being dimensioned so as to provide a push fit permitting removal of said plug from said socket and adjustment of the plane of said base member at any desired angular position about the axis of said plug.

3,909,968
DEVICE FOR HOLDING A CALENDAR, A PEN AND FOR HOLDING AN ATTACHMENT MEANS FOR A PAD, A WRITING PLATE OR THE LIKE

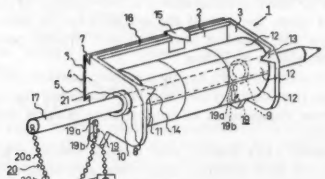
Gunnar Bolstad, Sorbacksgatan 21, S-216 25 Malmo, Sweden

Filed June 17, 1974, Ser. No. 480,129

Claims priority, application Sweden, June 18, 1973, 85045

Int. Cl.[2] B43M *17/00*

U.S. Cl. 40—358 3 Claims



1. In combination, a writing instrument with an attached clip and a calendar with holder comprising:
a. a U-shaped bracket having a waist portion and two leg portions;
b. an elongated roll rotatably mounted between said leg portions and having calendar indicia thereon;
c. means for slidably mounting a pointer on said waist portion of said bracket;
d. a central, axial opening through said roll aligned with cooperating openings through said leg portions;
e. a writing instrument, said opening being adapted to receive said writing instrument;
f. a chain comprising an alternate array of beads and connecting arms;
g. a keyhole slot extending through at least one of said leg portions and being located external to the periphery of said associated roll, said keyhole slot having a substantially circular portion larger in diameter than the diameters of said beads and a slotted portion smaller in width than the diameters of said beads, said keyhole slot cooperating with said chain to selectively and removably fasten said chain to said one of said leg portions at substantially any point along the length of said chain;
h. said writing instrument being attached to one end of said chain;
i. a clip attached to the other end of said chain;
j. whereby the position of the pointer selectively depicts calander indicia on said roll, the clip is adapted to support a pad or the like, and the writing implement can be housed within said axial opening.

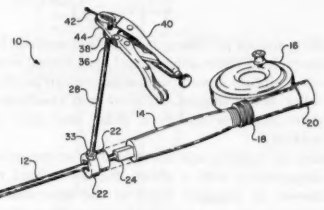
3,909,969
DEVICE FOR TYING ARTIFICIAL FLIES

James L. Finch, 2015 Devereux Dr., Burlingame, Calif. 94010

Filed Jan. 10, 1975, Ser. No. 539,980

Int. Cl.[2] A01K *87/00*

U.S. Cl. 43—1 10 Claims



1. A device for tying an artificial fly to a fish hook by means of a hook clamp and a fishing rod which includes at one end thereof an elongate handle, the device comprising the combination of a mounting collar formed with a central opening which is engaged about the rod, with one end of the collar abutting one end of the handle, a support post mounted at its proximal end to a side of said collar and extending radially outwardly therefrom, and means formed on the distal end of the post for fixedly holding said hook clamp in position for gripping a hook upon which a fly is to be tied.

3,909,970
WATERFOWL DECOY WITH ANCHOR LINE STORAGE AND DEPLOYMENT MEANS

Carl R. McGregor, 57 Mecartney Road, Alameda, Calif. 94501

Filed Aug. 19, 1974, Ser. No. 498,563

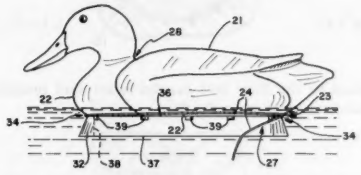
Int. Cl.[2] A01M *31/06*

U.S. Cl. 43—3 5 Claims

1. In a waterfowl decoy having a body of substantially the same size and configuration as the waterfowl to be simulated, said body including a base portion, decoy anchor means, an anchor line connecting said anchor means to said decoy, an anchor line storage and deployment means mounted to said decoy proximate said base portion, and said body being fur-

ther formed for releasable support of the weight of said anchor means by said decoy, the improvement comprising:

said anchor line storage and deployment means being provided as a substantially continuous, smooth, radially outwardly and downwardly tapering surface extending around and depending downwardly from said decoy proximate the periphery of said base portion, said surface being formed to provide an annular anchor line storage recess of substantial peripheral length for retention of



relatively large coils of said anchor line coiled around said body of said decoy, and said surface having a radius of curvature about said base and an outward taper enabling automatic gravity paying off of said coils of said anchor line upon release of the weight of said anchor means, said storage and deployment means being further formed with a flat bottom subjacent said surface, said bottom being adapted to retain said decoy in a stable upright position when said decoy is placed on a planar horizontal surface.

3,909,971

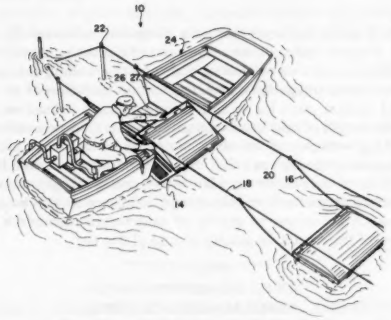
SYSTEM FOR CULTIVATING OF CULCHLESS OYSTERS

Frank W. Wilde, Shady Side, Md. 20867

Filed Jan. 20, 1975, Ser. No. 542,306

Int. Cl.[2] A01K *61/00*

U.S. Cl. 43—6.5 **17 Claims**



1. An oyster culture system for use in a tidal or similarly flowing body of water, comprising: a plurality of long lines, means securing the plurality of long lines in spaced proximity to each other and to the surface of said a body of water, a succession of sets of lines pendant from the long lines at spaced intervals therealong, a plurality of trays, respective means for floating each tray, a tray positioned for floating in said a body of water proximate each set of pendant lines, means attaching opposite end portions of the trays to respective pendant lines of a set, an oyster tender boat proportioned for deployment transversely beneath said plurality of long lines, the oyster tender boat having a midsection and cockpit structure proximate thereto in fore-and-aft relation, and the midsection having a substantially small amount of freeboard, whereby said trays may successively be manually drawn onto and discharged from said midsection with minimum effort and hazard.

3,909,972

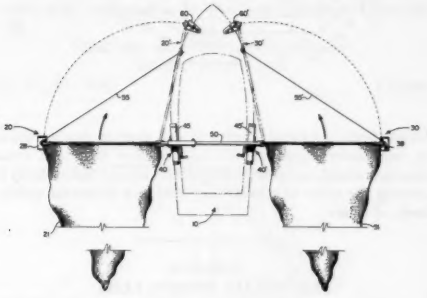
COLLAPSIBLE SHRIMP NET ACCESSORY FOR BOATS

Simon Ray Schoenberger, 1806 Bridge City Ave., Bridge City, La. 70094

Filed Nov. 25, 1974, Ser. No. 526,587

Int. Cl.[2] A01K *73/04*

U.S. Cl. 43—8 **13 Claims**



1. A collapsible and removable shrimp net accessory for standard type boats including pleasure boats of the recreational type comprising:

at least one wing net assembly having a frame for supporting a trawling net with the entrance thereto in open disposition to ultimately catch shrimp and the like when in trawling position;

mounting assembly means for mounting said wing net assembly on to the side of the boat, at least the bulk of said mounting assembly means being easily removable from the boat after attachment thereto; and

connection means for connecting said wing net assembly to said mounting assembly means; said connection means including:

a pivot section which allows said wing net assembly to be pivoted about an axis vertical to the boat for movement of said wing net assembly between a position athwarthship to a position lengthwise of the boat and positions intermediate thereto; and

a vertically movable section which allows said wing net assembly to be moved up and down in a plane vertical to the boat for movement of said wing net assembly in a plane vertical to the boat between a position above the water line of the boat to a position below the water line of the boat and positions intermediate thereto; the wing net assembly being locatable in operative shrimping position by positioning said wing net assembly athwarthship by means of said pivot section and below the water line by means of said vertically movable section, and being locatable in inoperative storage position without adding any great additional bulk to the boat by positioning said wing net assembly above the water line by means of said vertically movable section and lengthwise of the boat by means of said pivot section.

3,909,973

SONIC FISHING LURES

Herbert K. Fairbanks, St. George, Maine

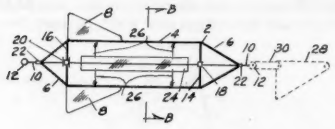
Filed Dec. 18, 1974, Ser. No. 533,863

Int. Cl.[2] A01K *85/00*

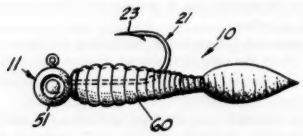
U.S. Cl. 43—42.31 **11 Claims**

1. A sonic fishing lure including an elongated, closed, hollow body, a shaft extending longitudinally of said hollow body, means supporting said hollow body for rotation relative to said shaft, means within said hollow body for creating resonant sound, said sound-creating means including a resilient wire

fixed at one end to one of said hollow body and said shaft and a plate fixed to the other of said hollow body and said shaft, the free end portion of said resilient wire projecting so as periodically to engage with and be flicked by said plate as said hollow body is rotated relative to said shaft to thereby impart an oscillatory movement to said resilient wire and create resonant sound, and fins on the outside of said hollow body for causing the same to rotate when said lure is moved within a body of water.



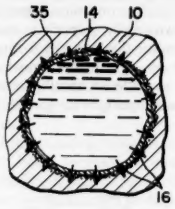
3,909,974
ARTIFICIAL FISHING LURE
Leslie Wayne Kent, 2820 McDonald Rd., Tyler, Tex. 75701
Filed Dec. 19, 1973, Ser. No. 426,110
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.31 **10 Claims**



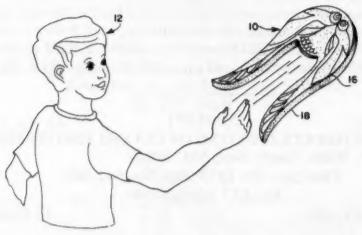
1. An artificial fishing lure comprising: an elongate hook having a shank with an eye at one end and a barbed portion at the other end, said hook shank being abruptly bent near said eye; two complementary lure body halves, each having abutting faces with attaching means thereon coengageable with complementary attaching means on the other body half for securing the body halves together to form a lure body; L-shaped groove means formed in the abutting faces of the body halves to receive the abrupt bend in the hook shank when said body halves are attached to each other about said hook shank, said body having a body cavity formed therein; and rattler means loosely carried in said body cavity whereby when said lure body is manipulated in water said rattler means repeatedly collides with the walls of said cavity to produce a rattling noise.

3,909,975
METHOD OF SOIL TREATMENT
Mario J. Basile, 8512 5th Ave., Brooklyn, N.Y. 11209
Filed Mar. 26, 1973, Ser. No. 344,961
Int. Cl.[2] A01M *17/00*
U.S. Cl. 43—124 **8 Claims**

1. The method of treating soil adjacent a structure for the destruction and prevention of termite infestation comprising positioning in such soil adjacent such structure a network of pipes, providing openings in said pipes, feeding into said pipe network a liquid termicidal composition, periodically applying a predetermined pressure to said liquid, forming the pipes of a pliable material in normally collapsed condition, expanding said pipes in response to the pressure applied to said liquid and forcing liquid through said openings of the expanded pipe into said surrounding soil to impregnate the soil with said liquid composition, whereby said pipes collapse when no pressure is applied to the fluid and expand when said predetermined pressures is applied to the fluid.

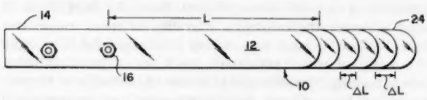


3,909,976
GLIDER TOY
Norbert A. Kirk, 6912 N. Ashland, Chicago, Ill. 60626
Filed Dec. 20, 1973, Ser. No. 426,589
Int. Cl.[2] A63H *27/00*
U.S. Cl. 46—79 **10 Claims**



1. A glider toy comprising an elongated, substantially planar, integral body portion comprised of a head section having in plan view a convex leading edge and two trailing elongated leg sections integrally connected to one end thereof to said head section, each leg section having a length at least as long as the length of said head section, the outer perimeter of each said leg section and the outer perimeter of said head section being coterminous such that the outer perimeter of said body portion is curvilinear in plan view, and a weight member attached to the bottom side of said head section at a location in which the center of gravity of said weight member is forward of the center of gravity of said glider toy.

3,909,977
NOISE-MAKING CLAPPER
Norbert A. Kirk, 43 E. Ohio St., Chicago, Ill. 60611
Filed Nov. 12, 1973, Ser. No. 414,941
Int. Cl.[2] A63H *5/06;* **B68B** *11/00*
U.S. Cl. 46—191 **10 Claims**



1. A clapper for making noise comprising a stack of at least three elongated, flexible, juxtaposed rigid blades; and means located a longitudinal distance from a first end of said stack for securing said blades in said stack, said blades having successively increasing operative lengths from said securing means such that said stack has at the first end a successively increasing stepped relationship among said blades and each of

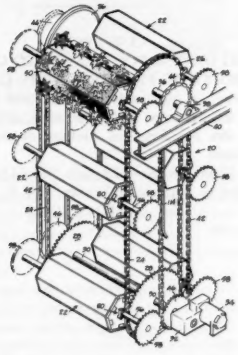
said blades having a rigidity so as to enable each of said blades when arcuately bent to return to a straightened position upon the release of the bent blade thereby producing a noise by the returning blade striking a previously returned blade.

3,909,978

METHOD AND APPARATUS FOR GROWING PLANTS

Margaret M. Fleming, 1933 Olive Ave., P.O. Box 1005, Fremont, Calif. 94538

Filed June 13, 1974, Ser. No. 478,911
Int. Cl.² A01G *31/00*
U.S. Cl. 47—1.2 **14 Claims**



1. An apparatus for holding horticultural plants while stimulating their growth comprising:

frame means;

a plurality of plant modules, each said module supporting at least one tray means for a multiplicity of plants, seedlings, cuttings, bulbs, flowers or other materials;

moving means on said frame means for carrying said plant modules along a continuous substantially vertical path; and

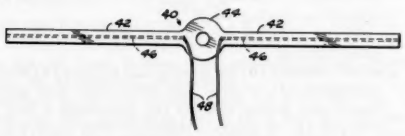
means engaging said moving means and said plant modules for rotating said plant modules and its tray means about a horizontal axis as they are being moved along said path whereby moisture and soil nutrients are prevented from gravitating to only one portion of each said tray means of said plant modules.

3,909,979

FLOWER STEM WRAPPER

Charles G. Perez, 3448 E. Edgemont, Tucson, Ariz. 85716

Filed Oct. 3, 1974, Ser. No. 511,841
Int. Cl.² A01G *5/00;* **A47G** *7/00;* **A41G** *1/00*
U.S. Cl. 47—55 **2 Claims**



1. A flower stem support, comprising:

an elongated strip of pliable plastic material having a thickness substantially less than its transverse width and having a centrally apertured transversely enlarged portion; and,

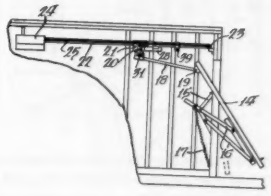
an elongated length of yieldable metallic material embedded within said strip, said enlarged portion is disposed intermediate the ends of said strip, and said wire is divided to form a pair of wires each having an end portion projecting laterally from the surface of said strip from opposing limits of said enlarged portion.

3,909,980

DOOR OPERATING MECHANISM

William B. Courtney, Hinsdale, and Edward I. Fox, Chicago, both of Ill., assignors to H. W. Crane Company, Maywood, Ill.

Filed May 16, 1974, Ser. No. 470,669
Int. Cl.² E05F *11/00*
U.S. Cl. 49—199 **1 Claim**



1. Door operating mechanism comprising, in combination with a door movable back and forth between a closed and an open position, a tubular track rectangular in cross-section, a trolley formed of a single sheet of material shaped to fit around four sides of the track and adapted to slide back and forth lengthwise on the track, the opposite side members of the trolley depending in laterally spaced relation beneath the track, a lock pin fixed to the track, a latching lever located intermediate said side members of the trolley and having a hook end adapted to engage and disengage said lock pin, said side members each having an elongated slot in lateral registration with the other slot and extending parallel with the track, a link connected at one end to the door and having a pivot pin at its opposite end extending through said slots and pivotal therein, said latching lever having pivotal movement on said pivot pin for movement of its hook end into and out of engagement with said lock pin, spring means for yieldingly urging the latching lever on said pivot pin in a direction for locking engagement with the lock pin, a latch control pin extending between and fixed to said side members of the trolley, and a cam surface on the latching lever arranged to engage said latch control pin against the action of said spring means for controlling movement of the latching lever on said pivot pin, in which the pivot pin fixed to the door connected link has a lost motion coaction with the latching lever through the elongated slots whereby upon movement of the trolley in a door opening movement with described cam surface on the latching lever engages its coacting pin and disengages the latching lever from the pin fixed on the track.

3,909,981

FOLDING BRACKET MECHANISM

Robert L. Bergkamp, and Helen G. Bergkamp, both of Rte. 2, Cheney, Kans. 67025

Filed Apr. 29, 1974, Ser. No. 465,266
Int. Cl.² E05F *11/24*
U.S. Cl. 49—340 **15 Claims**

1. A folding bracket mechanism, comprising:

a. a first brace support member,

b. a first brace member, pivotally connected in a first end portion on said first brace support member for swinging movement thereabout on a first axis,

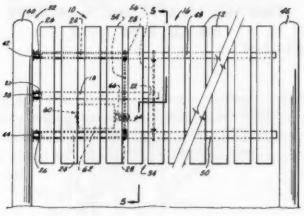
c. a second support member spaced from said first brace support member,

d. a second brace member pivotally connected in a first end portion on said second brace support member for swing-

ing movement thereabout on a second axis parallel to said first axis,

e. a supported member pivotally connected to and supported by the opposite end portions of said brace members at points spaced different distances from one end of said supported member, said supported member movable in a plane parallel to said first and second axes,

f. said folding bracket mechanism being movable between a first position wherein said second brace member is



generally perpendicular to a line through said support members and a second position wherein said brace members are parallel to said support members, and

g. said supported member having a channel member with said second brace member opposite end portion mounted therein and extending from the open side of said channel member, said second brace member being enclosed in said channel member when said folding bracket mechanism is in said first folded position.

3,909,982

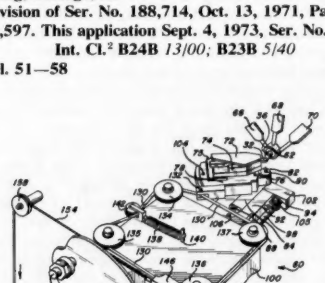
APPARATUS FOR PRODUCING CONTACT LENSES

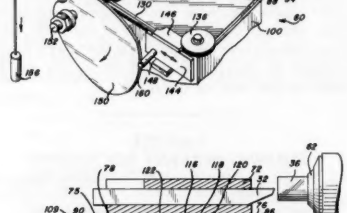
Walter A. Schlotfeldt, Addison, Ill., assignor to Med-Con Engineering, Chicago, Ill.

Division of Ser. No. 188,714, Oct. 13, 1971, Pat. No. 3,763,597. This application Sept. 4, 1973, Ser. No. 394,326

Int. Cl.[2] B24B *13/00;* **B23B** *5/40*

U.S. Cl. 51—58 **4 Claims**





1. In apparatus for forming contact lenses, the improvement comprising, in combination: a cutting tool for cutting the base curve into a contact lens blank; means for positioning the cutting tip of said cutting tool in fixed working relationship with respect to said blank; means for providing relative rotation between the lens blank and the cutting tool; means for pivoting said cutting tool about a pivot point; and means for moving said pivot point to vary the radius of curvature of the base curve to be cut; wherein said cutting tip positioning means comprises a pivotable holder assembly defining a first slot, and a member located adjacent to said holder assembly and defining a second slot, said holder assembly and said member being positioned so as to permit said first and second slots to be aligned; said means for moving said pivot point comprising a first slider for sliding within said first slot and a second slider for sliding within said second slot, said pivot point being fastened to said first and second sliders.

3,909,983

GRINDING DEVICE FOR REMOVING CAST METAL PROJECTIONS FROM FOUNDRY CASTINGS

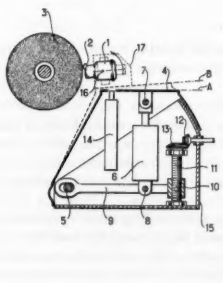
Roger Lasserre, St. Martin de Seignaux, and Jean-Pierre Darrieussecq, Bassussarry, both of France, assignors to Societe Anonyme des Fonderies et Ateliers de Mousserolles, Bayonne, France

Filed Nov. 8, 1973, Ser. No. 413,997

Claims priority, application France, Nov. 8, 1972, 72.39520

Int. Cl.[2] B24B *19/26*

U.S. Cl. 51—96 **6 Claims**



1. A device for grinding down a sizeable quantity of metal or similar material which is concentrated over a small area on a metal casting (**1**), said quantity of metal being disposed disymmetrically with respect to a given axis (**16**) of the workpiece (**11**), the device comprising:

a grinding wheel (**3**) mounted for rotation about its axis,

a workpiece support (**4**) for supporting said workpiece (**1**) for rotation about said given axis (**16**) and parallel to the axis of the grinding wheel,

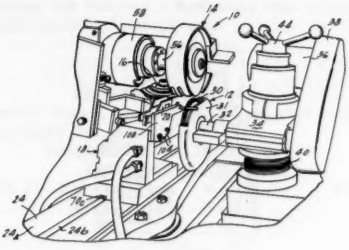
an element (**14**) for rotating said workpiece about said given axis and

a second element (**6**) for moving said support (**4**) and said workpiece (**1**) towards and away from said grinding wheel, said second element (**6**) comprising a jack (**6**), one end (**7**) of which is stationary with respect to the workpiece and the other end (**8**) of which is integral with an arm (**9**), said arm (**9**) resting at one end on a stationary point (**5**) and resting on its other end on a shaft (**11**) disposed in the plane formed by the axis of the jack (**6**) and said arm, and said device includes means (**10**) for adjusting the position of the bearing point of the arm (**9**) on said shaft (**11**).

3,909,984
PUNCH PIN FLAT GRINDING MACHINE

Thomas W. McLean, Chicago, Ill., assignor to Federal-Mogul Corporation, Southfield, Mich.

Continuation of Ser. No. 250,755, May 5, 1972, abandoned. This application June 6, 1974, Ser. No. 477,104
Int. Cl.[2] B24B 7/02
U.S. Cl. 51—82 R 8 Claims



1. An apparatus for grinding a plurality of predetermined portions of a generally cylindrical shaped pin to produce a punch pin having a generally cylindrical portion with at least two flat surfaces provided thereon with one of the flat surfaces being disposed opposite the remaining flat surfaces, the apparatus comprising:

at least a first and a second grinding means for grinding the generally cylindrical portion of the pin with each of said grinding means having a grinding surface;

means for supporting said grinding means with the grinding surface of the first grinding means facing the grinding surface of the second grinding means and being spaced therefrom;

pin holder means for gripping the generally cylindrical portion of the pin including a supporting surface having a generally cylindrical groove therein conforming with the generally cylindrical portion of the pin disposed on said supporting surface, a clamping arm having at least one end to engage a pin disposed on said supporting surface, and operator means for moving the arm to clamp a pin on said surface, said holder means being moveable along a linear path on a plane surface from a position withdrawn from the grinding means to a position passing the pin clamped on the supporting surface between the spaced grinding surfaces to simultaneously form flat surfaces on opposite sides of the generally cylindrical portion;

said clamping arm having a second end connected to the operator means, and a pivot point intermediate said ends, said pin engaging end of said clamping arm including a pair of spaced prongs engaging said pin at spaced points along the length of the pin, and said second grinding means being positioned to grind a flat surface in said pin in at least one point between said prongs.

3,909,985
APPARATUS FOR GRINDING A KNIFE INCLUDING KNIFE HOLDING AND GUIDING MEANS

Fritz Knecht, Vogt, Heissen, Germany, assignor to Tecmed A.G., St. Margrethen, Switzerland

Division of Ser. No. 180,306, Sept. 14, 1971, Pat. No. 3,808,746. This application Dec. 6, 1972, Ser. No. 312,724
Claims priority, application Germany, Aug. 13, 1971, 2140596
Int. Cl.[2] B24B 3/54
U.S. Cl. 51—124 R 2 Claims

1. An apparatus for grinding a knife blade comprising:

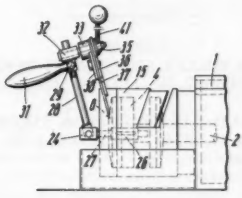
a motor housing having a pair of driven shafts extending in opposite directions from opposite sides of said housing;

respective grinding disks mounted on each of said shafts and rotatable therewith, said disks having lateral grinding faces turned in opposite directions away from said motor housing;

a pair of protective housings fixed to said motor housings against rotation relative thereto, each of said protective housings being formed with at least one respective slot lying in a plane inclined to the axis of the respective shaft and adapted to receive a blade to be ground and to guide the blade against a respective one of said lateral faces with a predetermined grinding angle; and

a holding and guiding device for said blade for displacing same with a predetermined grinding movement automatically in said slot, said device including:

a pivot shaft mounted on one of said protective housings and defining a first pivot axis,



a guide arm swingable about said first pivot axis,

means for adjustably securing said guide arm at a fixed orientation to said pivot shaft parallel to the one of said slots of said one of said protective housings whereby said arm is constrained to swing parallel to the last-mentioned plane,

a connecting arm extending at a right angle to said guide arm and mounted thereon for movement along said guide arm,

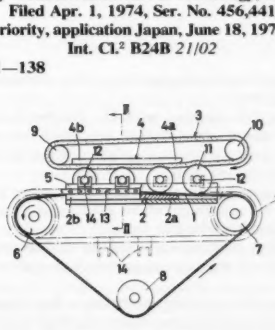
a first grip on said connecting arm for shifting same along said guide arm with one hand of an operator for varying pressure of the blade against a respective one of said disks, and

a blade-mounting head carrying said blade and shiftable along said connecting arm while being provided with means for fixing said head to said connecting arm.

3,909,986
APPARATUS FOR GRINDING CYLINDRICAL WORKPIECES

Shinichi Miyazawa, Kawasaki; Hidehiko Takeyama, and Kaneyoshi Miyasaka, both of Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

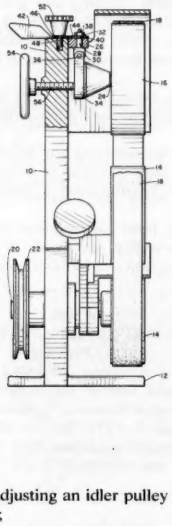
Filed Apr. 1, 1974, Ser. No. 456,441
Claims priority, application Japan, June 18, 1973, 48-68477
Int. Cl.[2] B24B 21/02
U.S. Cl. 51—138 3 Claims



1. An apparatus for grinding cylindrical workpieces having axially extending shafts on the opposites ends thereof, comprising in combination:

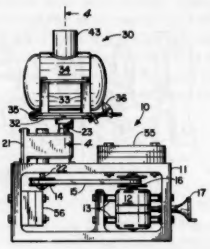
an upper platen;
a lower platen disposed opposite said upper platen;
a grinding belt arranged to run at a high speed over said lower platen;
a feed belt arranged to travel under said upper platen, said feed belt producing on said workpieces to be ground a frictional force greater than the force which said grinding belt exerts thereon;
a pair of rolling tables disposed respectively along each side of said lower platen to receive said shafts of said workpieces; and
means for conveying said workpieces through the opening between said grinding belt and said feed belt,
whereby the feed belt causes the shafts of a multiplicity of workpieces to be pressed against and rolled on said rolling tables while the workpieces are being ground to a fixed size by said grinding belt.

3,909,987
IDLER PULLEY ADJUSTMENT DEVICE
Donald W. MacCarthy, Sr., 11227 E. Rincon Dr., Whittier, Calif. 90606
Filed Dec. 18, 1974, Ser. No. 534,036
Int. Cl.[2] B24B *21/00, 23/06, 25/00*
U.S. Cl. 51—148 **5 Claims**



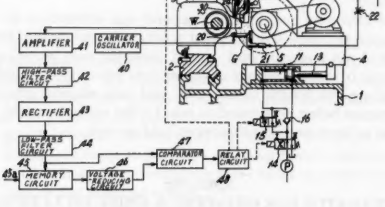
1. A device for adjusting an idler pulley comprising:
an upright frame;
a first adjustable member rotatably attached to said frame for adjustment about a first axis, said first adjustable member having a square shoulder portion terminating in a round threaded shaft;
a second adjustable member rotatably attached to said first member for adjustment about a second axis substantially perpendicular to the first axis;
an idler pulley rotatably supported by said second member on a third axis substantially perpendicular to said first two axes;
an elongated flat adjusting arm having a first lengthwise slot in one end engaging the square shoulder portion of the first adjustable member, said arm having a second slot substantially perpendicular to the first; and
guide means passing through said second slot for limiting arcuate adjustment of said first member.

3,909,988
CRYOGENIC DEFLASHING APPARATUS
William S. Kerwin, Minneapolis; John Rodney Nelson, Edina, and Hans Robert Toll, St. Anthony Village, all of Minn., assignors to Toll Cryogenics, Inc., Minneapolis, Minn.
Filed June 7, 1973, Ser. No. 367,863
Int. Cl.[2] B29B *31/06*
U.S. Cl. 51—163 **9 Claims**



1. Apparatus for deflashing molded parts, comprising:
a. a generally elongated container for holding the parts to be deflashed, said container having generally rounded interior end portions;
b. means for supporting said container for rotation about an axis substantially perpendicular to the longitudinal axis of said container;
c. means connected to said supporting means for imparting rotational oscillatory motion to said container; and
d. media in said container for deflashing the molded parts when the container is oscillated.

3,909,989
GRINDING MACHINE WITH FEED RATE CHANGING DEVICE
Tamaki Tomita, Okazaki; Ryoji Yamada, and Shiro Takayama, both of Kariya, all of Japan, assignors to Toyoda Machine Works, Ltd., Aichi-Pref., Japan
Filed Nov. 27, 1974, Ser. No. 527,858
Claims priority, application Japan, Mar. 9, 1974, 49-27377
Int. Cl.[2] B24B *49/08*
U.S. Cl. 51—165.77 **4 Claims**



1. A grinding machine comprising:
a bed;
a wheel slide slidably mounted on said bed;
a grinding wheel rotatably mounted on side wheel slide;
a work table for supporting a workpiece;
feed means for moving said wheel slide toward and away from said workpiece;
an electric power source;
a first electrode mounted adjacent to said grinding wheel and connected to said electric power source for applying a potential to the surface of said grinding wheel;

a second electrode mounted adjacent to said grinding wheel for detecting the change of the difference of potential caused by the approach of said grinding wheel to a workpiece in order to generate a control signal;

an electrostatic screening member for encircling said second electrode except at the surface thereof opposed to said grinding wheel, said electrostatic screening member being connected to the ground; and

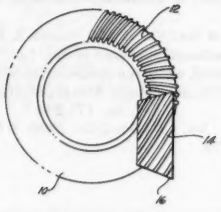
control means for controlling said feed means so as to change the feed rate of said wheel slide in accordance with said control signal.

3,909,990

FINISHING HYPOID GEARS

Richard W. Tersch, Grosse Pointe Woods, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Oct. 24, 1973, Ser. No. 409,166
Int. Cl.[2] B24B *1/00, 19/00*
U.S. Cl. 51—287 **13 Claims**



1. The method of making highly accurate hypoid form master dies having a surface finish on tooth profiles of about 4–6 micro-inches which comprises heat treating a cut hypoid gear of high speed steel to a hardness of about 60–65 Rockwell C, thereafter grinding the gear to improve form and eliminate any nicks and burrs, and to cause the surface finish of its tooth profiles to approach the desired range, and finally polishing the ground gear by rolling it in mesh with an abrasive hypoid polishing tool whose teeth have a surface hardness of between 75 Durometer A and 55 Durometer D with its teeth in light pressure contact with the teeth of the tool at a peripheral speed of about 100–1,000 feet per minute for a few seconds to produce a micro-inch finish of about 4–6 on the tooth profiles.

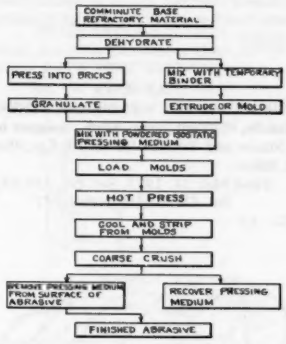
3,909,991

PROCESS FOR MAKING SINTERED ABRASIVE GRAINS

Loring Coes, Jr., Princeton, Mass., assignor to Norton Company, Worcester, Mass.

Filed Sept. 22, 1970, Ser. No. 74,257
Int. Cl.[2] C09C *1/68;* **C09K** *3/14*
U.S. Cl. 51—309 **2 Claims**

1. A process for making sintered abrasive grains of theoretical density, by comminuting a base refractory material selected from the group consisting of bauxite, spinel, alpha-alumina, zirconia and mixtures thereof to a powder having an average particle size of less than 1 micron, preforming said fine powder to the approximate size and shape of the abrasive grains desired, and sintering said fine powder making up said preformed abrasive grains, wherein the improvement comprises, accomplishing said sintering step by: (a) mixing said preformed abrasive grains with a quantity of powdered graphite isostatic pressing medium sufficient to totally surround and separate each of said abrasive grains, said isostatic pressing medium being essentially non-reactive with said refractory material, and having a sintering temperature above the sintering temperature of said refractory material; (b) subjecting the mixture of said preformed abrasive grains and said isostatic pressing medium to a presing temperature between 1200° and 1600°C in a non-oxidizing atmosphere, at a pressure of not less than 2000 pounds per square inch sufficient to cause essentially complete densification of said preformed abrasive grains, for a time period sufficiently short to prevent any



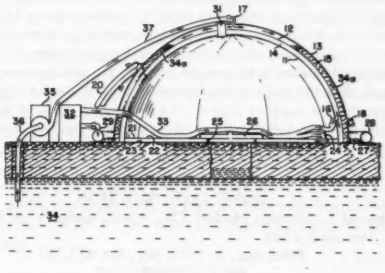
significant increase in the average crystal size of the comminuted refractory material; (c) cooling the hot pressed mixture of isostatic pressing medium and abrasive grains; and (d) separating said hot-pressed abrasive grains from said isostatic pressing medium.

3,909,992

INFLATABLE ICE IGLOO

Jerry D. Stachiw, Lakeside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 18, 1974, Ser. No. 452,312
Int. Cl.[2] E04B *1/345*
U.S. Cl. 52—2 **5 Claims**



1. A rapidly erectable shelter for subfreezing climes comprising:

first means for enclosing a first shell-shaped chamber having a first fitting communicating therewith, said first shell-shaped chamber has a width sufficient to provide insulation and to reduce the problems associated with condensation on the inside of said rapidly erectable shelter;

a source of pressurized gas coupled to said first fitting to distend said first enclosing means to define a first shell shaped chamber;

second means for enclosing a second shell-shaped chamber having a second fitting communicating therewith, said second shell-shaped chamber is sized to be larger than said first shell-shaped chamber to be disposed adjacent to and supported by said first enclosing means when said first enclosing means is distended by said source of pressurized gas;

the first enclosing means and the second enclosing means are flexible sheets shaped and arranged to form a three-walled, two-chambered hemispherical shell; and

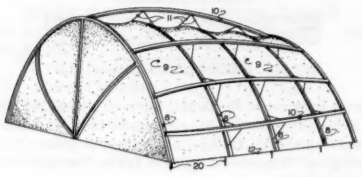
a source of water coupled to said second fitting for filling said second shell-shaped chamber, said water freezes to the solid state after being introduced into said second shell-shaped chamber thereby forming the supporting structure for said rapidly erectable shelter while said first shell-shaped chamber serves to insulate and to prevent droplets from forming in the interior of said rapidly erectable shelter.

3,909,993

ARCH SUPPORTED MEMBRANE STRUCTURE

Carl F. Huddle, Pleasant Ridge, Mich., assignor to Jon Vredevoogd, Mason and Tension Structures Co., Pleasant Ridge, both of, Mich.

Filed May 14, 1973, Ser. No. 359,892
Int. Cl.[2] E04B *1/32, 1/347*
U.S. Cl. 52—63 **15 Claims**



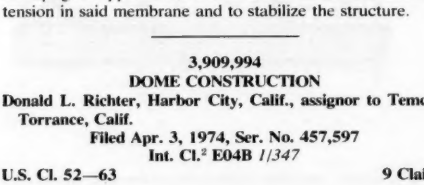
1. A tensioned membrane shelter comprised of a multiplicity of upright arches with curved bights, consecutively spaced apart in parallel relationship and mounted on the ground or other base that includes at least one shallow resilient transverse arch with each end attached to an upright support arch and extending between them in perpendicular relationship as it bridges at least one intermediate upright support arch to form a structural frame in space; a flexible but structural membrane operatively attached to and extending between said upright support arches that is concavely curved inwardly between the bights of said upright arches to form a roof of double curvature that is tensioned longitudinally and transversely between said upright arches; the arrangement being such that the shallow transverse arch is bowed to urge apart the upright support arches attached to its ends to maintain tension in said membrane and to stabilize the structure.

3,909,994

DOME CONSTRUCTION

Donald L. Richter, Harbor City, Calif., assignor to Temcor, Torrance, Calif.

Filed Apr. 3, 1974, Ser. No. 457,597
Int. Cl.[2] E04B *1/347*
U.S. Cl. 52—63 **9 Claims**



1. A joint construction for securing an edge margin of a sheet of material to a structural frame member having a top flange provided with spaced longitudinally extending rib means defining a longitudinally extending recess, one of said ribs providing surfaces for support of and engagement with the edge margin of the sheet of material, the provision of:

an elongated retainer member secured to the other of said rib means along its length;

said retainer member having side faces extending above and below the support surface of the rib means;

an elongated retainer gasket element carried by the retainer member and having an external longitudinally extending surface portion engageable with an edge margin of the sheet of material supported by said one rib means;

said gasket element extending along side faces of the retainer member and providing a molding surface between said carrier member and said sheet material to provide a seal therebetween;

said one rib means having a longitudinal ridge line contacted by said edge margin;

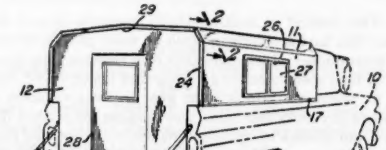
and means including part of said side faces on said retainer member for wedging said gasket element against said edge margin and said edge margin against said ridge line during securement of the retainer member to the other of said rib means.

3,909,995

PICK-UP COVER

Huston K. Bainter, and Marvin E. Nerem, both of Forest City, Iowa, assignors to Winnebago Industries Inc., Forest City, Iowa

Continuation of Ser. No. 15,602, March 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 777,934, Sept. 9, 1968, abandoned, which is a continuation of Ser. No. 536,058, March 21, 1966, abandoned. This application Aug. 19, 1971, Ser. No. 173,234
Int. Cl. E04c *2/24;* **E04h** *1/12*
U.S. Cl. 52—79 **14 Claims**

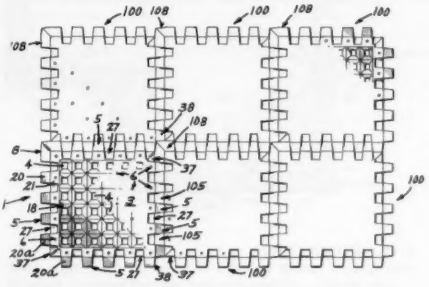


1. A sandwich construction panel prepared in generally flat form for converting into a multi-sided structure having a center section and side sections, said panel being a one-piece member comprising a pair of spaced facing members located adjacent opposite sides of an expanded compressible one-piece plastic foam core, one of said facing members being pliable material, the opposite facing member being nonpliable material, bonding means securing the facing members to opposite sides of the core, rigid means located between the facing members and extended along the edges and the sides of the panel to reinforce the edges and sides of the panel, at least one first V-groove formed in said non-pliable facing member, core and rigid means to separate the center section and the one side section, at least one second V-groove formed in said opposite facing member, core and rigid means to separate the center section and the other side section, said first and second V-grooves extended through the opposite non-pliable facing member into the core, the bases of said grooves being spaced from the pliable member, said pliable member remaining whole opposite said V-grooves whereby force applied to the sections of the panel on opposite sides of said V-grooves produces bends in said panel forming at least three sides of a multi-sided structure, said foam plastic core adjacent the bases of said grooves being compressed, unbroken and bonded to the one pliable facing member.

3,909,996
MODULAR FLOOR MAT

Ralph Ettlinger, Jr., Glencoe, and Glenn L. Beall, Gurnee, both of Ill., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Dec. 12, 1974, Ser. No. 531,868
Int. Cl.² E04C *1/10*
U.S. Cl. 52—177 **9 Claims**



1. A unitary modular floor mat which can be used individually or in combination with other adjoining mat modules to cover a floor surface, comprising:

a. a unitary support frame comprised of a plurality of interconnected and spaced apart support flanges, at least some of said support flanges having coplanar top and bottom edges;

b. a tread surface supported above the floor surface by said support frame, said tread surface having top and bottom surfaces, said bottom surface integrally attached to the top edges of said support flanges;

c. said tread surface containing a plurality of drainage openings for draining substances off of the tread surface onto the underlying floor surface and ventilating the floor surface;

d. a plurality of finger elements protruding outwardly from each side of said support frame to intermesh with finger elements on an adjoining mat module, each of said finger elements having at least two side surfaces which support a top surface, a first portion of said top surface being integral and coplanar with said tread top surface and a second portion being an inclined surface which slopes outwardly and downwardly away from said tread surface toward the floor surface to form an inclined threshold surrounding the mat periphery to prevent tripping;

e. each of said finger elements being spaced apart a sufficient distance so as to receive between adjacent finger elements a finger element from an adjoining floor mat module to create a generally continuous tread surface from interlocked mat modules;

f. interlock means attached to each of said finger element side surfaces to forcibly engage the finger element of an adjoining mat module which is positioned between adjacent finger elements, thereby interlocking adjacent floor mat modules;

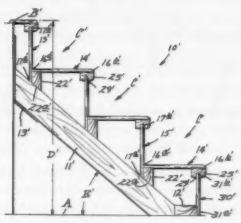
g. a plurality of unitary traction plugs for providing traction to the tread surface and the bottom surface of said support frame, each of said traction plugs having a flexible resilient top portion protruding above the tread surface and a flexible resilient base portion protruding below the bottom edge of said support flanges to abut the floor surface; and

h. attachment means for attaching said traction plugs to said floor mat with the plug top portion protruding above said tread surface and the plug base portion protruding below the bottom edge of said support flanges.

3,909,997
STAIR CONSTRUCTION

John K. Eickhof, Box 599, Crookston, Minn. 56716

Filed Jan. 9, 1974, Ser. No. 431,862
Int. Cl.² E04F *11/02, 11/10*
U.S. Cl. 52—188 **10 Claims**



1. As an article of manufacture, a prefabricated stair building unit comprising:

a wooden tread member having front and rear edges and a lower surface;

a wooden riser member having top and bottom edges and a front surface;

a wooden heel cleat extending longitudinally of the tread surface having upper and lower surfaces and a rear surface perpendicular to said upper surface;

a wooden toe cleat extending longitudinally of the tread surface having upper and lower surfaces;

means rigidly securing the rear surface of said heel cleat to the front surface of said riser member along the bottom edge thereof to form a beam of which the riser member is the web and the heel cleat is the lower flange;

means rigidly securing the lower surface of said tread member to the upper surface of said heel cleat with the rear edge of said tread member abutting the front surface of said riser member;

means rigidly securing the upper surface of said toe cleat to the lower surface of said tread member along the front edge thereof;

and groove means in the lower surface of said toe cleat for receiving the upper edge of another riser member, so that said toe cleat may form therewith the upper flange of said beam.

3,909,998
ROOF CONSTRUCTION SYSTEM

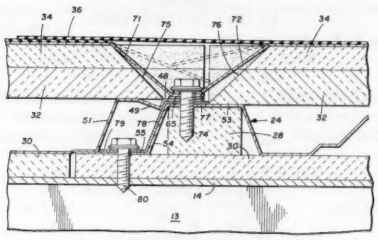
Harold Graves Simpson; Warren Elsworth Scruggs, both of Oklahoma City; Richard Clark McClain, Moore, and Norman Douglas Rice, Oklahoma City, all of Okla., assignors to Star Manufacturing Company of Oklahoma, Oklahoma City, Okla.

Filed Feb. 27, 1973, Ser. No. 336,370
Int. Cl.² E04C *2/18, 2/36*
U.S. Cl. 52—223 **41 Claims**

1. A construction plank comprising:

a core structure including a corrugated metal panel having longitudinally extending corrugations therein, and adapted to bridge between spaced support members extending transversely of the corrugation and support a load applied to the planks, said corrugations defining spaced apart parallel panel surfaces, a first wall board member disposed at one surface of said panel, a layer of insulation disposed at the other surface of said panel, a plurality of spacer members extending parallel to said ribs

and disposed between a surface of said panel and said first wall board member, a second wall board member overlying said layer of insulation, said second wall board having a relatively hard, smooth upper decking surface; and



a membrane sheet bonded to the said decking surface, said sheet having two adjacent edge portions extending beyond the corresponding edge of said core structure and adapted to overlap a next adjacent plank of similar construction when said panels are arranged in contiguous aligned relationship to form a generally weather impervious seal.

3,909,999

STRUCTURE FOR WATERPROOFING A WATER CISTERN OF A WATER TOWER OF PREFABRICATED ELEMENT CONSTRUCTION

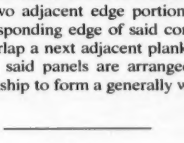
Matti Aapeli Janhunen, Kiertotie 2, Westend, Finland

Continuation of Ser. No. 133,846, April 14, 1971, abandoned. This application May 21, 1973, Ser. No. 362,078

Claims priority, application Finland, Apr. 15, 1970, 1040/70

Int. Cl.[2] E04B *1/32, 11/04*

U.S. Cl. 52—249 **7 Claims**



1. In a waterproof cistern structure for a water tower adapted to be constructed in situ, including a plurality of wedge-shaped radially extending prefabricated concrete elements forming a bottom wall surface of said cistern structure; a central column for said water tower supporting said bottom wall surface; a plurality of contiguous upstanding concrete elements being supported on said radially extending concrete elements proximate the radially outer edges thereof so as to form the peripheral wall of said cistern structure; the improvement comprising: at least one single-piece liquid-tight elastic foil being positioned in said cistern structure, said elastic foil being freely suspended from the upper ends of said central column and said upstanding concrete elements so as to extend in unattached superposition along the bottom wall, upstanding wall surfaces of said concrete elements and central column for substantially the entire external surfaces of said foil whereby said foil is maintained in surface contact with said cistern structure through the force of water pressure therein.

3,910,000

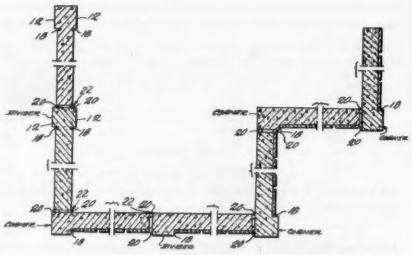
PRECAST PANELS WITH CORNER-DIVIDER PROJECTIONS

Paul S. Kelsey, P.O. Box 103, Forestdale, Mass. 02644

Division of Ser. No. 379,313, July 16, 1973. This application Apr. 16, 1974, Ser. No. 461,416

Int. Cl.[2] E04F *13/14;* **B44F** *7/00, 11/06*

U.S. Cl. 52—259 **8 Claims**



1. A wall comprising:

two upright panels butted end to end and having a seam of joint fitting caulking material applied between them on at least one exposed side of the wall;

each panel being constituted from panel facing material and hardened panel backing composition and having at least the face thereof corresponding to said one exposed side of the wall provided with an integral piller-like projection of greater thickness than the remainder of the panel, disposed at one end of the panel and set-off from the remainder of said face by a groove running from top to bottom thereof; said groove being at least partly filled with the same joint filling caulking material as said seam.

3,910,001

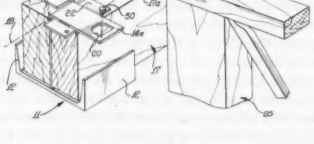
BEAM CONNECTOR

Edgar D. Jackson, Alta Loma, Calif., assignor to Steel Web Corporation, Alta Loma, Calif.

Filed June 10, 1974, Ser. No. 477,627

Int. Cl.[2] E04B *5/00;* **E04C** *3/12;* **F16B** *1/00*

U.S. Cl. 52—281 **8 Claims**



1. A two beam connector comprising

a. a base in the form of a channel having laterally spaced flanges upstanding from a base web,

b. a plate integral with said web and upstanding in a plane spaced between the flanges and parallel thereto, the plate extending substantially above the top levels of the flanges,

c. the plate including a pair of tabs forming a vertical slot therebetween at a level above the tops of said beams receivable into the channel at opposite sides of the plate with the beams extending longitudinally, the tabs being downwardly bendable in opposite directions about longitudinal axes toward the tops of said beams for attachment thereto,

d. there being two auxiliary plates respectively integral with the tabs, one auxiliary plate facing in one lateral direction to be swung downwardly on one tab to engage the top of one beam, and the other auxiliary plate facing in the opposite lateral direction to be swung downwardly on the other tab to engage the top of the other beam.

3,910,002

LOCATION MEANS FOR RAFTER ON COLUMNS

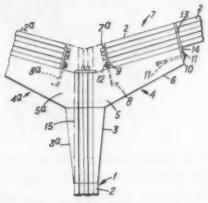
David Royle Lough, 21 Everton Ter., Wellington, New Zealand

Filed Sept. 21, 1973, Ser. No. 399,443

Claims priority, application New Zealand, Sept. 21, 1972, 168457

Int. Cl.² E04B *1/00*

U.S. Cl. 52—283 **2 Claims**



1. Means for locating and securing a rafter defined by at least two similar units arranged in end to end jointing relationship on and relative to a column for supporting an end of such rafter, with the column having an upper end surface and a distal side surface extending normal to the upper end surface, said means including a first lug projecting from the upper end surface of the column, said first lug having an aperture therein, a first bolt extending from the butt end of the rafter, the axis of the first bolt being substantially parallel to the axis of the rafter, a second bolt projecting from the distal side surface of the column and extending substantially parallel to the axis of the rafter, a second lug secured between the joining ends of the units and extending laterally therefrom, the second lug having an aperture therein, the apertures of the first and second lugs, when the rafter is in position, receiving the first and second bolts, and means cooperable with each of the bolts for securing the rafter to the upper end surface and the distal side surface of the column.

3,910,003

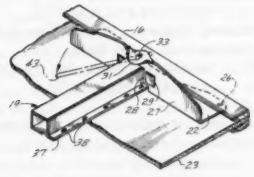
DOOR STIFFENER

Torsti T. T. Jerila, Baldwin Park, Calif., assignor to Acme General Corporation, San Dimas, Calif.

Filed Mar. 14, 1974, Ser. No. 450,995

Int. Cl.² E04G *25/00*

U.S. Cl. 52—632 **14 Claims**



1. A door stiffener comprising:

a torsion bar having a length approximating the length of a door; and

a pair of clamps for connecting the torsion bar to a door, each of said clamps comprising:

a flat face sheet;

means for connecting the face sheet tightly against the face of a door in a substantially fixed position adjacent an edge of the door;

a connector sheet normal to the face sheet and integral therewith;

a window through the connector sheet having one edge adjacent the face sheet and extending away from it towards the free edge of the connector sheet remote from the face sheet defining a web of connector sheet between the window and the free edge, said window having a shape complementary to the cross section of the torsion bar and having sufficient clearance therefrom to permit longitudinal sliding of the clamp along the torsion bar with the connector sheet normal to the length thereof; and

said web being twistable from a first position in the plane of the connector sheet with the window clearing the torsion bar to a second position at least partly twisted out of the plane of the connector sheet with the window pulled closed against the sides of the torsion bar.

3,910,004

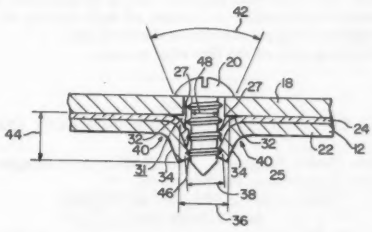
SHAPED APERTURE IN ENAMELED SHEET METAL

Jack E. Bebinger, Columbus, Ohio, assignor to White-Westinghouse Corporation, Cleveland, Ohio

Filed June 24, 1974, Ser. No. 482,195

Int. Cl.² F16B *5/02*

U.S. Cl. 52—758 D **5 Claims**



1. A shaped aperture in a porcelain enameled sheet metal panel of predetermined thickness, said shaped aperture having a configuration particularly adapting it for receiving and threadably securing therein a screw having a predetermined root diameter and outside thread diameter subsequent to being enameled and confining any enamel cracking upon receipt of said screw to within said shaped aperture, and wherein said shaped aperture is formed from the metal panel and comprises:

an inwardly bent annular portion having a bend radius of less than about twice the thickness of said panel;

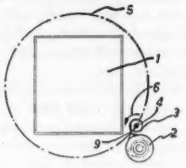
a truncated cone portion extending inwardly from said inwardly bent annular portion;

said truncated cone portion terminating in an aperture at the plane of truncation with said aperture having a diameter on the order of said root diameter of said screw, and said portion further having a base diameter at its juncture with said annular portion, with said base diameter greater than said outside thread diameter; wherein said screw is received in said shaped aperture and displaces the material immediately surrounding said aperture at the plane of truncation outwardly exerting a tensile force upon the enamel covering the cone portion and wherein said bend radius rigidifies the junction of said cone with the surrounding panel to prevent tensile forces extending into said panel to limit the fracture of said enamel to said cone portion.

3,910,005
PROCESS AND MACHINE FOR PACKING

Hubert A. Thimon, and Gregoire Levante, both of Aix les Bains, France, assignors to Societe d'Applications Thermiques, France

Filed Nov. 26, 1973, Ser. No. 418,974
Claims priority, application France, Nov. 24, 1972, 72.42505; July 26, 1973, 73.27489
Int. Cl. B65b *13/02*
U.S. Cl. 53—3 **15 Claims**



1. A method of packing a load in a film of material, comprising;

moving a length of film approximately corresponding to a periphery of the load to be packed from a supply area, and around an axis thereof into a cylindrical transfer magazine with a shaft, parallel to said axis; thereafter

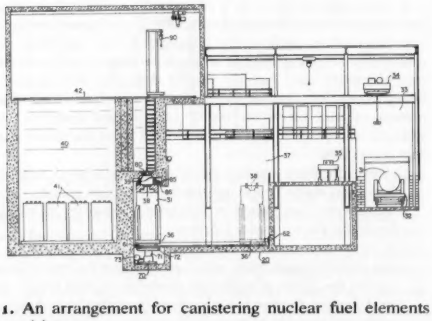
moving said magazine relative to the load and around the load starting form a point in the vicinity of the supply area to form a loop of film around the load, the film moved onto the cylindrical magazine being progressively unwound therefrom in the course of such moving of the magazine to apply the film of the load; and

then joining ends of the film edge to edge.

3,910,006
FUEL ELEMENT HANDLING ARRANGEMENT AND METHOD

Benjamin James, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 7, 1973, Ser. No. 367,992
Int. Cl. B65b *5/00*
U.S. Cl. 53—37 **14 Claims**



1. An arrangement for canistering nuclear fuel elements comprising:

a structure having fuel elements stored therein, said structure being filled with a fluid having radiation shielding properties, a plugged opening in a bottom surface of said structure, a space under said plugged opening for positioning a canister under said structure and in vertical alignment with said plugged opening, said canister serving to contain fuel elements during shipment thereof;

means for lifting said canister vertically upwardly into direct mounting relationship with the underside of said structure and for lowering said canister out of mounting relationship with the underside of said structure;

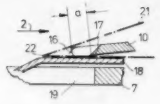
means for sealing between said canister and said structure when said canister is mounted to said structures; and

means for transferring the fuel elements being stored in said structure into said canister.

3,910,007
DEVICE FOR OPENING THE FLAPS OF ENVELOPES

Wilfried Dorer, Donaueschingen, Germany, assignor to Mathias Bauerle GmbH, St. Georgen, Germany

Filed Mar. 25, 1974, Ser. No. 454,252
Claims priority, application Germany, Apr. 26, 1973, 2321128
Int. Cl.² B65B *57/04, 43/26*
U.S. Cl. 53—58 **9 Claims**



1. A stripper device for lifting and opening a flap of an envelope at a work station prior to transporting the envelope to a filling station of an envelope stuffing machine, comprising:

means for transporting an envelope having a folded flap closure to the work station with the flap facing upwardly and trailing a lead edge of the envelope in the direction of envelope transport;

a guide plate defining a transport plane for supporting an envelope at the work station;

a stripper member pivotally mounted above and transverse to the transport plane for movement between an inoperative position spaced from the envelope at the work station and an operative position in engagement with the envelope, said stripper member comprising a continuous singular member having a lead edge comprising rounded segments at its lateral ends and a knife blade section intermediate said ends and recessed from the rounded lead edges;

biasing means for urging the envelope against said stripper member; and

means actuable by the lead edge of the envelope transported to the work station for moving the stripper member from the inoperative position to the operative position whereby the knife blade engages and lifts the flap of the envelope and the rounded lead edges open and fold back the flap of said envelope and prevent the knife blade from coming into cutting engagement with the fold of the flap.

3,910,008
VACUUM PACKAGING

H. William Johnson, Ventura, Calif., assignor to Svenska Manufacturing Corporation, Santa Rosa, Calif.

Filed Aug. 20, 1974, Ser. No. 499,051
Int. Cl.² B65B *31/02*
U.S. Cl. 53—112 A **8 Claims**

1. In an apparatus for packaging articles between an upper and lower sheet comprising;

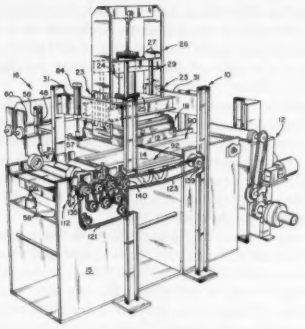
vacuum forming means;

a vacuum base member supported by a frame, said base member including passageways in communication with said vacuum forming means, said passageways being open at predetermined locations on said member proximate peripheral portions of a lower sheet placed thereon;

a lower sheet conveying system comprising drive means engagable with said lower sheet at a point downstream

from said vacuum base member, and sheet support members located along the path of travel of said lower sheet adjacent said vacuum base member; and,

a movable housing mounted above said base member on said frame including means to reciprocate said housing



between an upper position and lower position, and including heating means and upper sheet retaining means operating in response to the position of the housing, said housing being adapted to substantially sealingly engage said base member radially outward from said passageways.

3,910,009

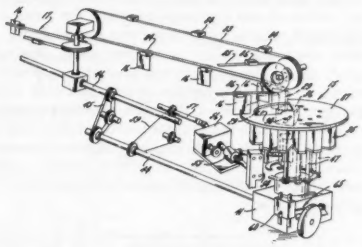
MACHINE FOR ESTABLISHING A CONTROLLED ATMOSPHERE IN PACKAGES

Allen B. Canfield, Rockford, Ill., assignor to Rexham Corporation, Rockford, Ill.

Filed Sept. 25, 1974, Ser. No. 508,982

Int. Cl.[2] B65B *31/02*

U.S. Cl. 53—112 B **15 Claims**



11. A machine for establishing a non-oxidizing atmosphere in open-topped pouches and for closing the tops of the pouches, said machine comprising a support, an indexable turret rotatable step-by-step about an upright axis on said support and having a series of upwardly opening chambers spaced angularly about said axis, each of said chambers stopping at angularly spaced loading, first conditioning, second conditioning, closing and unloading stations when said turret dwells between steps, a pouch holder associated with each chamber and movable between a raised position located out of the chamber and a lowered position disposed in the chamber, each of said holders being in a raised position when the associated chamber is in said loading station, means in said loading station for automatically loading a pouch into each raised holder in the loading station, means for lowering each loaded holder into its respective chamber prior to advancement of the chamber into the first conditioning station, a stationary member overlying said turret and closing off the upper ends of said chambers from the time the chambers are moved to first conditioning station until just prior to the time the chambers reach said sealing station, means in one of said conditioning stations and communicating through said stationary member with each chamber in such station to evacuate the atmosphere from such chamber, means in the other of said conditioning stations and communicating through said stationary member with each chamber in such station to introduce a non-oxidizing gas into such chamber, opposed sealing bars located in said sealing station above said turret, an enclosure surrounding said sealing bars, means for establishing a non-oxidizing atmosphere within said enclosure, means for raising each holder in said sealing station out of its chamber to place the pouch in said holder into said enclosure, said last-mentioned means being operable to lower the raised holder back into the associated chamber after the top of the pouch has been sealed by said bars and before the chamber is advanced out of said sealing station, means for raising each holder out of its chamber after the chamber has been advanced out of said sealing station, and means in said unloading station for automatically removing the pouch from each raised holder in said unloading station.

3,910,010

PLUGGING MACHINES

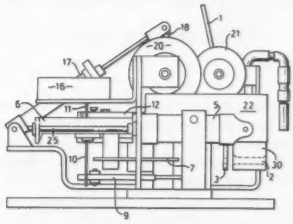
Ronald W. Cowley; Reginald Hallwood, both of Barking, and Norman Lockwood, Rayleigh, all of England, assignors to John Poulten Limited, Barking, England

Filed Oct. 18, 1973, Ser. No. 407,483

Claims priority, application United Kingdom, Nov. 10, 1972, 52144/72

Int. Cl.[2] B65B *63/02, 55/00*

U.S. Cl. 53—115 **4 Claims**

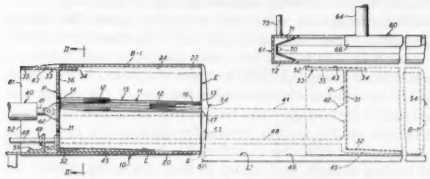


1. Apparatus for inserting a fibrous plug into the end of a hollow member comprising severing means, means for feeding a fibrous strand incrementally and vertically downwardly toward said severing means for cutting plug lengths from the end of the strand, said severing means including a knife edge and a roller, a reciprocatable carriage movable relative to said knife edge, said roller connected to said reciprocatable carriage and connected to roll along said knife edge to sever a plug length from the end of the strand disposed therebetween, a needle-like probe connected to said carriage and adapted to contact a severed plug length of fibrous material and to insert it into the end of the hollow member, means connected for reciprocating the carriage, means for clamping the end of the strand against movement during severing by said roller and knife edge, and means for moving the end of the fibrous strand laterally away from the severing means after a plug length has been cut away therefrom, the means for moving the end of the strand being connected for operation by the reciprocatable carriage.

3,910,011
APPARATUS FOR PACKAGING STACKED ARTICLES

Robert L. Beninger, Sheboygan, Wis., assignor to H. G. Weber and Company, Inc., Kiel, Wis.

Filed Dec. 5, 1973, Ser. No. 421,989
Int. Cl.[2] B65B *25/14*, *53/02*
U.S. Cl. 53—124 A 16 Claims

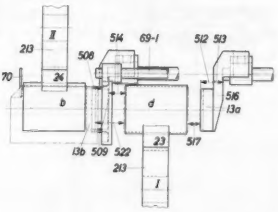


1. Apparatus for packaging articles, which comprises means for peripherally confining a bundle of said articles while leaving surface portions of said articles accessibly exposed, means for enveloping said bundle within an open-ended sleeve of a heat-shrinkable film, means for moving the enveloped bundle to a pressure station, means at said pressure station for effecting pressure contact between said enveloping means and said exposed surface portions and means for heat-shrinking said film into close contact with said exposed article surface portions while leaving film edges surrounding said opening accessible for manual engagement after said heat-shrinking step has been performed.

3,910,012
DEVICE FOR WRAPPING BLOCK-LIKE ARTICLES

Alfred Schmermund, 62 Kornerstrasse, 5820 Gevelsberg, Germany

Filed Dec. 26, 1973, Ser. No. 427,436
Claims priority, application United Kingdom, Jan. 11, 1973, 1551/73
Int. Cl.[2] B65B *11/28*
U.S. Cl. 53—234 1 Claim



1. A device for wrapping block-like articles in wrapping material comprising in combination:

a frame;

a first revolver mounted on said frame to be rotatable about a first axis of rotation;

a plurality of first cell defining means provided on said first revolver, each said first cell being adapted to receive one said article;

a second revolver mounted on said frame to be rotatable about a second axis of rotation parallel to said first axis; a plurality of second cell defining means provided on said second revolver, each said second cell being adapted to receive a web of wrapper material of channel section;

first support means secured to said frame to define a first fixed slideway extending parallel to said first and second axes;

guide means mounted on said first support means to extend between said revolvers and to be reciprocatably displaceable along said first slideway, said guide means comprising a plurality of guide members arranged to define a guide channel therebetween, said guide channel being of generally rectangular cross-section in a plane perpendicular to said axes of rotation of said revolvers, said guide channel being bounded at a side thereof remote from said second axis of rotation by a rigid guide member and at each of the other three sides by guide members which are each mounted to be resiliently yieldable in a direction outward of said guide channel, one of said guide members having a slot defined therein to extend parallel to said axes of rotation;

drive means to impart such stepwise rotational movement to said first and second revolvers that the latter come to rest at successive orientations in which one cell of said second revolver is in alignment with one cell of said first revolver in a direction parallel to said axes of rotation, said aligned cells then being situated next adjacent mutually opposite ends of said guide means;

second support means to said frame to define a second fixed slideway extending parallel to said first and second axes; a pusher member slidably mounted on said second slideway and having a portion projecting into a feed path extending through said one cell in said first revolver and through said guide channel, said projecting portion being adapted to extend through an opening in a radially outer wall of said one cell in said first revolver and being adapted to extend through said slot;

displacing means to cause said pusher member to execute reciprocal stroke displacements along said second slideway, said block-like article being displaced - during a forward stroke displacement of said pusher member - from said one cell of said first revolver through said guide channel and into a channel defined by said wrapper material in said one cell of said second revolver, said pusher member - during said forward stroke displacement - being displaced to a position in which said first revolver is freed for said stepwise rotational movement under the control of said drive means, said drive means and said displacing means being so co-ordinated that — during a return stroke displacement of said pusher member — said pusher member passes between two successive cell defining means of said first revolver whilst the latter is being rotationally displaced by said drive means; and

further displacing means to reciprocatably displace said guide means along said first slideway to cause said guide means to traverse a portion of said feed path extending between said revolvers, the guide members of said guide means being adapted to enter said one cell of said second revolver when the guide means is displaced towards said second revolver, thereby to provide positive guiding of said article when the latter passes into said one cell of said second revolver.

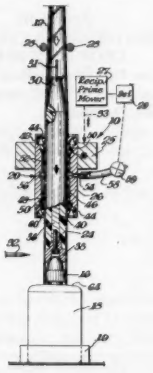
3,910,013
APPARATUS FOR APPLYING TUBULAR NECKBANDS TO CONTAINERS

Joseph G. Babineau, Arnprior, Canada, assignor to Pfizer Inc., New York, N.Y.

Filed Feb. 13, 1974, Ser. No. 441,957
Int. Cl.[2] B67B *5/00*; B65B *41/04*
U.S. Cl. 53—291 11 Claims

1. An improved apparatus for feeding shrinkable tubular band stock over the necks of containers comprising a reciprocating sleeve and floating internal mandrel gripping said tubular band stock between them and feeding it forward when the mandrel strikes the neck of a container characterized in that a resilient tubular insert having a substantial length is mounted within the sleeve and is disposable in forceful resilient pressure against the tubular band stock and the floating mandrel within it, the mandrel has an antifriction surface disposed opposite the pressure of the resilient tubular insert whereby downward movement of the sleeve and tubular band stock past the bottom end of the mandrel after it is arrested on the

necks of the containers to extend the band stock around the necks of the containers is facilitated and length of upward and downward movement of the extended end of the tubular band stock is precisely controlled, said resiliant tubular insert comprising a tubular diaphragm having upper and lower ends, sealing means securing said upper and lower ends to upper

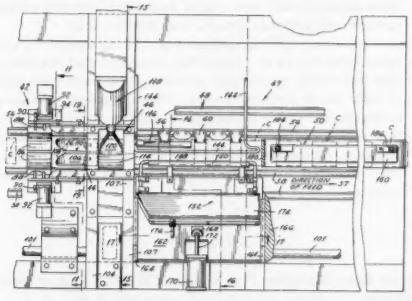


and lower portions within said sleeve whereby an annular pressure-tight chamber is formed between the tubular insert and the inside of said sleeve, and a source of pressure is connected to said sleeve into communication with said chamber whereby said tubular diaphragm is firmly pressed against said tubular band stock and said mandrel within it to minimize slippage.

3,910,014
APPARATUS FOR CLOSING AND SEALING CONTAINERS

Eric A. Braun, Northville, Mich., assignor to Ex-Cell-O Corporation, Detroit, Mich.

Filed Feb. 19, 1974, Ser. No. 443,594
Int. Cl.[2] B65B *7/18*
U.S. Cl. 53—373 **23 Claims**

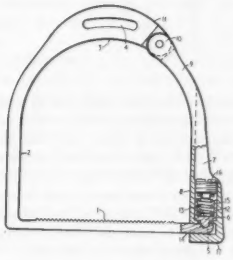


13. Apparatus for closing and sealing an end closure of a container having a tubular body to form a closed and sealed flat end closure for the container, the material of the end closure including thermoplastic material and having front, rear and side panels each extending axially from the tubular body in its open position, each of the end closure panels having a sealing strip defined at its outer end by a scored line and the rear panel including a closure flap extending from the outer edge of its sealing strip, said apparatus comprising: closing means operable to fold the end closure panels to a closed position with the side panels folded beneath the front and rear panels with the front and rear panels lying substantially flat and transversely of the tubular body to close the end of the tubular body with the sealing strips and closure flap projecting outwardly of the tubular body; welding means operable to weld the sealing strips together to seal and secure the end closure panels in their closed position; and closure flap folding and welding means operable to fold the axially projecting sealing strips and closure flap over the front panel and weld the closure flap to the front panel such that the closure flap lies flat over the front panel, said flap closure means comprising a guide rod and a heating rod in substantially spaced, parallel relationship with each other, said guide rod being operable to bend the closure flap of a carton toward said heating rod as said carton moves from said welding means to said closure flap folding and welding means.

3,910,015
STIRRUP

Errol Ebejer, 7 Mathew Flinders Pl., Burraneer, New South Wales 2230, Australia

Filed May 18, 1973, Ser. No. 361,721
Int. Cl. B68c *3/00*
U.S. Cl. 54—49 **3 Claims**



1. A stirrup comprising loop means, for attachment to a saddle leather, a first support integrally formed with and depending from one end of said loop means, a platform having one end coupled to the lower free end of said first support, said loop means, first support, and platform being permanently rigidly interconnected as a single piece so that said platform at all times extends laterally from said first support in vertically spaced relationship with said loop means, a second support having one end pivotally connected to the other end of said loop means and having a lateral slot at its free end to receive the other end of said platform, said free end of said second support further comprising latching means for engaging complementary means on said platform to maintain said second support in engagement with said platform, said latching means disengaging said platform to permit said second support to swing away from said platform when said second support is subjected to an outwardly directed sidewise force, said platform remaining capable of supporting the foot of a rider even after said platform is disengaged by said second support.

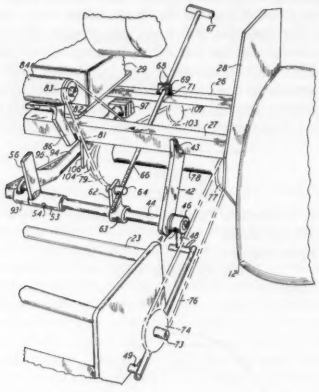
3,910,016
GANG LAWN MOWER

Anthony J. Salia, South Milwaukee; Donald G. Haffner, Glendale, and Knud H. Hoffmeyer, Racine, all of Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.

Filed Aug. 8, 1974, Ser. No. 495,635
Int. Cl.[2] A01D *35/24*
U.S. Cl. 56—7 **8 Claims**

1. A gang lawn mower comprising a tractor having a prime mover and ground wheels and a frame, a plurality of lawn

mowers with two thereof disposed in side-by-side relation and being articularly connected together at their adjacent inner ends thereof, a lawn mower attaching member rotatively supported on said frame rearwardly of said two mowers and presenting a rotation axis extending transverse to the fore-and-aft axis of said tractor, a pusher member connected to said attaching member to be rotatable therewith relative to said rotation axis and extending from said attaching member



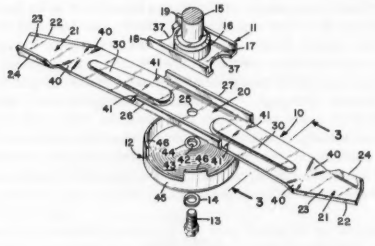
and toward said two mowers, said pusher member having an extending end disposed adjacent said two mowers, connecting mechanism interconnected with said two mowers and said extending end of said pusher member, and a resilient mechanism connected with said attaching member to yieldingly urge said attaching member about its said rotation axis in the direction tending to raise and extending end of said pusher member, and thereby tend to raise said two mowers and thus counterbalance the weight of said two mowers.

3,910,017

ROTARY MOWER BLADE

Richard A. Thorud, Bloomington, and Herman P. Christopherson, Burnsville, both of Minn., assignors to The Toro Company, Bloomington, Minn.

Filed July 26, 1974, Ser. No. 492,337
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—295 **2 Claims**



1. A mower blade for rotation about a central substantially vertical axis comprising a pair of tip portions unitary with a central portion:

each of said tip portions comprising a leading, longitudinal beveled cutting edge, a body, and a trailing sail extending upwardly from said body;

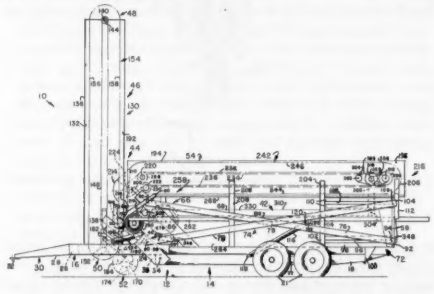
said central portion including upward flanges, extending for limited distances along the central edges thereof; and upward medial longitudinal ribs extending outwardly from locations nearer the center of the blade than the outward terminations of said flanges, said ribs being broader near the center of the blade and tapering uniformly to become narrower at their outward ends, symmetrical about the longitudinal axis of the blade and symmetrically positioned about the blade center.

3,910,018

MACHINE FOR FORMING A COMPACT STACK OF CROP MATERIAL

Gene R. Butler; Lee D. Butler, both of Kingsburg, and David L. Darnall, Fresno, all of Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Apr. 5, 1974, Ser. No. 458,261
Int. Cl.[2] A01D *89/00*
U.S. Cl. 56—350 **15 Claims**



1. In a machine for forming a stack of crop material, such as a compact stack of has or the like, the combination comprising:

a mobile chassis adapted to move across a field;

means mounted upon said chassis for forming crop material into a stack as a compact stack of said crop material;

means mounted upon said chassis adjacent said stack forming means for continuously delivering crop material from the field to above and adjacent a first end of said stack forming means, said delivering means having a portion extending above said stack forming means from adjacent said first end thereof to adjacent an opposite second end thereof for continuously delivering said crop material from adjacent said first end of said stack forming means toward said opposite second end thereof; and

means mounted upon said chassis and being extensible and retractable below and along the extend of said portion of said delivering means and above and between said ends of said stack forming means for supporting said crop material and being delivered by said portion from said first end toward said opposite second end of said stack forming means and for progressively discharging said crop material from said portion to said stack forming means.

3,910,019

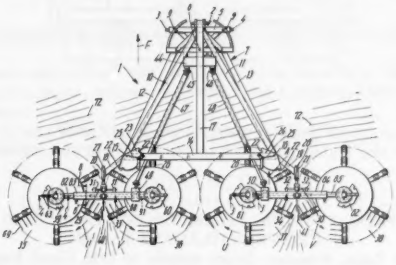
HAY-MAKING MACHINE

Jacques Roby Schlittler, Post Clugin, CH-7421 Andeer, Switzerland

Continuation-in-part of Ser. No. 351,186, April 16, 1973, abandoned. This application Aug. 20, 1974, Ser. No. 499,080
Int. Cl.[2] A01D *81/00*
U.S. Cl. 56—367 **18 Claims**

1. A hay-making machine attachable to a tractor and comprising a frame and rotary rakes secured to said frame of the machine, said rotary rakes being supported on the ground so as to be transportable and being drivingly rotatable about approximately vertical axes of rotation, said machine frame having a main support frame, said main support frame as seen

from above having substantially the shape of an equilateral triangle, the base of said triangle lying transverse to the normal direction of travel of the machine and the apex of said triangle pointing in said direction of travel, a main gearbox driveable by the tractor, a linking device for attaching the machine to the tractor, said main gearbox and said linking device being arranged adjacent the apex of said triangle,



support bearings each having an approximately vertical bearing axis and each being disposed at a respective one of the base angles of said triangle, auxiliary frames each supporting a group of rotary rakes, each said auxiliary frame being pivoted in a zone between the rotary rakes thereof on a respective one of said support bearings so as to be pivotable and lockable in position with respect to the main support frame.

3,910,020

LATERAL DISPLACEMENT OF CROP LYING ON THE GROUND

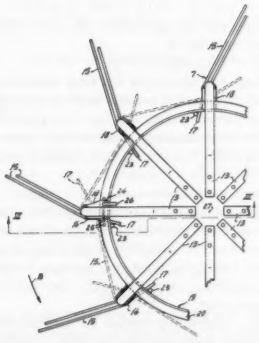
John Edward Spindler, Lower Moor Farm, Minety, Malmesburg, Wiltshire, England

Continuation of Ser. No. 298,846, Oct. 19, 1972, abandoned. This application Nov. 30, 1973, Ser. No. 420,649

Claims priority, application Netherlands, Oct. 20, 1971, 7114394

Int. Cl. A01d *79/00*

U.S. Cl. 56—370 **24 Claims**



1. A raking implement for laterally displacing crop lying on the ground comprising a frame and at least one circular tined member being rotatably mounted on said frame, said tined member being rotatable about a non-horizontal axis, and having a plurality of tines pivotally supported on said member adjacent the outer periphery thereof, movable means on paid tined member mounted within and adjacent the periphery of said tined member and said means being pivotably linked to said tines, said means being displaceable with respect to the non-horizontal axis for said tined member independently of the tined member to pivot said tines simultaneously to different positions, said tines also being independently pivotable to at least one working position from an inoperative position, responsive to the rotation of said member.

3,910,021

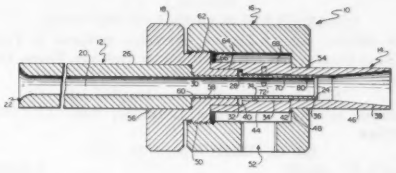
STRAND STRIPPER AND RECLAIMER

Louis B. Van Petten, Union Bridge, Md., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 29, 1974, Ser. No. 464,959

Int. Cl.² B65H *73/00*

U.S. Cl. 57—1 UN **4 Claims**



1. A device for reclaiming staple fibers from a spun yarn or spun roving comprising:

an outlet chamber having at least first and second connected concentric internal passages having a common longitudinal axis and an outlet exiting from the second chamber;

an inlet chamber having an inlet connected to a passage extending through the inlet chamber and having the same longitudinal axis as the outlet chamber, a first portion of the inlet chamber mounted within the outlet chamber in a space relationship defining a large cavity adjacent the first passage, and a second portion of the inlet in a spaced relationship defining a small cavity adjacent the second passage;

a housing at least partially surrounding each chamber, and securing them together;

means associated with the first passage for providing a vortex of air to occur in the first cavity, progressing to the second cavity and exiting through the outlet;

means for sucking yarn or roving into the inlet chamber; and

means within the passages for untwisting the yarn or roving to cause the staple fibers to separate from the yarn or roving and individually exit the outlet.

3,910,022

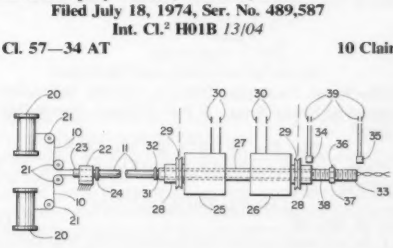
APPARATUS FOR STRANDING WIRES

Phillip John Reed, Montreal, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed July 18, 1974, Ser. No. 489,587

Int. Cl.² H01B *13/04*

U.S. Cl. 57—34 AT **10 Claims**



1. Apparatus for stranding wires, comprising:

an elongate flexible tubular member having an inlet end and an outlet end;

means for holding the inlet end of the flexible tubular member stationary;

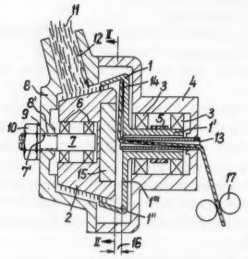
means for reciprocating the outlet end of the flexible tubular member through a predetermined number of rotations in alternate directions;

a plurality of independent dividers axially spaced along the tubular member and extending diametrically across the bore of the tubular member to define a plurality of paths through said bore from said inlet end to said outlet end; twisting means for reciprocation in unison with said outlet, said twisting means including a plurality of apertures, an aperture for each of said plurality of paths.

3,910,023
APPARATUS FOR OPEN-END SPINNING

Peter Müller, Bremen-Lesum, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Sept. 30, 1974, Ser. No. 511,306
Claims priority, application Germany, Nov. 17, 1973, 2357514
Int. Cl.² D01H *1/12, 1/20, 1/22*
U.S. Cl. 57—58.95 **6 Claims**



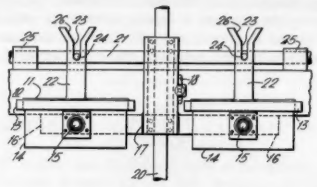
1. In apparatus for open-end spinning and including two parts mounted for coaxial rotation in the same direction and constituting, respectively, a break-up roller for breaking up a stream of fibers and a spinning rotor arranged to receive fibers which have been broken up by the break-up roller and to spin them into a length of yarn, the improvement comprising: direct drive means connected for directly rotating only one of said parts; and indirect drive means connected to at least one of said parts for causing the part not directly rotated by said drive means to be rotated exclusively by the rotation of said part which is directly driven by said drive means, while preventing physical driving contact between said parts.

3,910,024
STRAND WINDING MECHANISM

Walter Ernst, Guttingen, Thurgau, am See, Switzerland, assignor to Ernest Scragg & Sons Limited, Macclesfield, England

Filed Dec. 26, 1973, Ser. No. 428,612
Claims priority, application United Kingdom, Dec. 22, 1972, 59353/72
Int. Cl.² D01H *1/02, 7/64*
U.S. Cl. 57—75 **7 Claims**

1. In a strand winding mechanism of the type comprising winding spindles having upright axes, a vertically traversing ring rail extending horizontally and normal to the axes of said winding spindles, and a ring-and-traveler mechanism for each winding spindle carried by said ring rail, the improvement comprising mounting means mounting each ring of the respective mechanism for pivotal tilting movement relative to said ring rail and the respective spindle about a substantially horizontal pivot axis; ring actuating means mounted on said ring rail movable relative thereto; and coupling means coupling said ring actuating mechanism with said rings for effecting

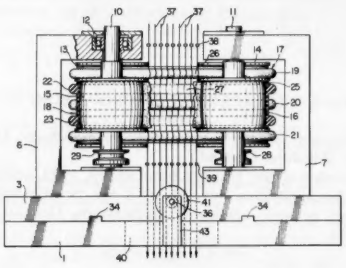


simultaneous tilting of the latter about said pivot axes when said ring actuating means is moved relative to said ring rail.

3,910,025
FALSE-TWISTING APPARATUS FOR PRODUCING CRIMPS IN FILAMENT YARNS

Isao Takai, Komatsu, Japan, assignor to Oda, Gosen Kogyo Kabushiki Kaisha, Komatsu, Japan

Filed Feb. 11, 1974, Ser. No. 441,565
Claims priority, application Japan, Feb. 12, 1973, 48-16528
Int. Cl.² D02G *1/04*
U.S. Cl. 57—77.4 **6 Claims**



1. In a false-twisting apparatus for producing crimps in filament yarns comprising:

a first set of two spaced pulleys,

a first endless belt having a backing member applied between said two spaced pulleys to have a straightly extending region therebetween and having a plurality of endless longitudinally extending, transversely spaced projecting ridges integrally formed on said backing member of this first belt,

a second set of two spaced pulleys,

a second endless belt having a respective second backing member applied between said second set of two spaced pulleys to have a straightly extending region therebetween and having at least one endless longitudinally extending projecting ridge integrally formed on said second backing member,

said straightly extending region of said second belt being parallel with and opposite to the straightly extending region of said first belt, in staggered relation thereto,

the direction of travel of said straightly extending region of said second belt being the opposite of the direction of travel of said first belt,

said at least one projecting ridge in the straightly extending region of said second belt being positioned between two adjacent projecting ridges in the straightly extending region of said first belt, and

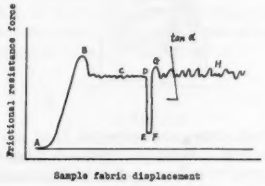
means for adjusting the parallel distance between the straightly extending regions of the first and the second belts to enable the required false-twisting to be given to filament yarns fed from one of the projecting ridges in the

straightly extending region of one of said belts to a projecting ridge in the straightly extending region of the other of the belts and therefrom to the next projecting ridge in the straightly extending region of said one of said belts in alternate contact with the respective projecting ridges in the straightly extending regions of these two belts.

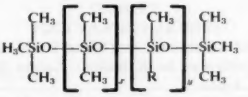
3,910,026
ACRYLIC FIBER PRODUCT HAVING ANIMAL HAIRY HAND

Masao Sone; Kojiro Arai, and Katsuaki Nomura, all of Okayama, Japan, assignors to Japan Exlan Company, Limited, Japan

Filed Nov. 13, 1973, Ser. No. 415,399
Claims priority, application Japan, Nov. 14, 1972, 47-114131
Int. Cl.² D02G *3/04, 3/36, 3/40*
U.S. Cl. 57—140 BY **3 Claims**



1. An acrylic fiber product having an animal hair-like hand comprising a heat-treated yarn or knit or woven fabric containing mix-spun (1) animal hair fibers, (2) nonshrinkable acrylic fibers having a monofilament fineness 50 to 100 % of the average monofilament fineness of the animal hair fibers and having a silicone resin defined by the formula



wherein

R is $R'NH_2$, $R'NHR''$ or $R'NR''_2$, R′ is CH_2, *n* is 1 to 3, R″ is C_mH_{2m+1}, *m* is 1 to 3, *x* and *y* are positive integers and the molecular weight of the silicone resin is less than 100,000

deposited on the fiber surfaces in an amount of 0.1 to 3.0 % based on the dry weight of the fibers and (3) highly shrinkable acrylic fibers having a latent shrinkage at least 3 % higher than the latent shrinkage of the nonshrinkable acrylic fibers.

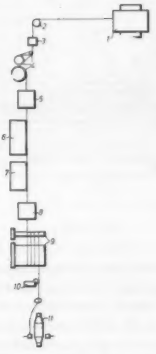
3. An acrylic fiber product as claimed in claim **1** wherein the said product has a stress reduction rate, tan α, at the time of kinetic friction of 5 to 25 g./min.

3,910,027
PROCESS FOR THE SIMULTANEOUS STRETCH TEXTURING OF FILAMENT YARN

Hans Bach, Dormagen; Udo Hänsel, Nievenheim; Karl-August Heinroth, Dormagen; Hans-Dieter Jürischka, Dormagen, and Rudolf Jurgen Klee, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Dec. 5, 1973, Ser. No. 421,984
Claims priority, application Germany, Dec. 5, 1972, 2259434
Int. Cl.² D02J *13/00;* **D02G** *1/02;* **D01H** *13/28*
U.S. Cl. 57—157 TS **6 Claims**

1. Process for the production of a textured endless yarn by the simultaneous false twisting and stretch texturing of unstretched or not completely stretched yarn of high molecular weight, fibre-forming linear polymers, in particular polyesters, using at least two heating zones separated from each other in space between the delivery cylinder and the draw-off roller, in which process the yarn is delivered from the delivery cylinder to a first heating zone at texturing velocities of 200 to 600 metres per minute, is heated in this heating zone without

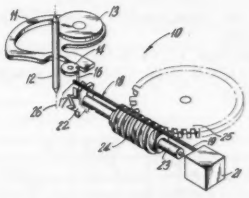


substantial mechanical stress at yarn tensions of less than 0.05 p/dtex to a yarn temperature between T = glass temperature and T + 50°C, and thereafter, at yarn tensions of 0.1 to 0.5 p/dtex, which build up between the first and second heating zone, it is stretched in the ratio of between 1 : 1.5 and 1 : 4.5 and simultaneously friction false twisted and heat fixed between the delivery cylinder and draw-off roller at yarn temperatures of below 160°C.

3,910,028
CONTACT SPRING INDEX SYSTEM FOR TIMEPIECES

Jean G. Suard, Besancon, France, assignor to Timex Corporation, Waterbury, Conn.

Filed Feb. 13, 1975, Ser. No. 546,489
Int. Cl.² G04C *3/04;* **G04B** *15/00*
U.S. Cl. 58—28 B **7 Claims**



1. An indexing system for timepieces having a drive means coupled to said system comprising:

an oscillatory member driven by said drive means and having contact means mounted thereon,

a contact spring fixedly mounted at one end and having the other free end periodically engaged by the contact means during the movement of the oscillatory member,

a shaft rotatably mounted within the timepiece and adjacent the contact spring, said shaft having a worm gear portion and a ratchet wheel mounted to be engaged and driven by the contact spring, and

timing means engaging the worm gear portion of the shaft to be indexed thereby when the contact spring drives the ratchet wheel under urging of the contact means on the oscillatory member.

3,910,029
LIQUID CRYSTAL TIMEPIECE WITH IMPROVED DISPLAY PANEL

Satoshi Yamazaki, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

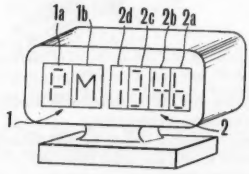
Filed Aug. 1, 1973, Ser. No. 384,866
Claims priority, application Japan, Aug. 3, 1972, 47-77798; Aug. 4, 1972, 47-68145
Int. Cl.[2] G04B *19/30*; H05K *1/00*
U.S. Cl. 58—50 R 14 Claims

1. An electronic timepiece comprising a liquid crystal display panel for displaying the time, said panel including an upper plate, a lower plate, a spacer between said plates and around the periphery of said lower plate, one of said plates having a passage therethrough proximate said spacer for introducing liquid crystal into the space defined by said plates and said spacer, and a stopper in said passage; a base; a frame having a recess therein for receiving said display panel, and an opening through which said panel may be viewed, said frame overlapping said spacer and said passage minimally, thereby providing maximum space on said display panel for display of time while hiding from view said spacer and said passage; electronic circuitry for timekeeping and driving said display panel; electrical connecting means connecting the output of said electronic circuitry to said display panel for actuating said display panel and displaying the time; and holding means for holding said circuitry and said frame to said base, wherein said base has a notch therein, the shape of said notch being such as to provide for transit therethrough of said connecting means between said electronic circuitry and said display panel.

3,910,030
DIGITAL CLOCKS

Motoo Iwade, Ise, Japan, assignor to Ise Electronics Corporation, Ise, Japan

Filed Sept. 12, 1973, Ser. No. 397,123
Int. Cl.[2] G04B *19/30*; G04C *9/00*; G04B *9/00*
U.S. Cl. 58—50 R 7 Claims

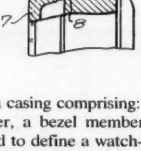


1. A digital clock comprising
a plurality of digit display means arranged to display times, a source of clock pulses,
first means responsive to said clock pulses for producing a first output to operate said digit display means in a predetermined sequence,
manual means including means for entering desired times to be displayed coupled to said first means to produce a second output from said first means to operate said first means in the same sequence but at a high speed for rapidly changing the time displayed by said digit display means, and
coincidence means for comparing said times displayed by said digit display means and said desired times in said means for entering and for discontinuing said second output from said first means on coincidence.

3,910,031
WRIST-WATCH CASING

Teruho Keida, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokorozawa, Japan

Filed Aug. 19, 1974, Ser. No. 498,366
Claims priority, application Japan, Aug. 21, 1973, 48-93631
Int. Cl.[2] G04B *37/00*; F16B *27/00*
U.S. Cl. 58—88 R 8 Claims

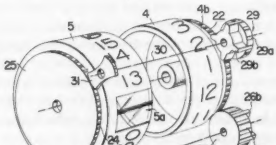


1. A wrist-watch casing comprising:
a casing member, a bezel member and a back member interconnected to define a watch-casing structure;
a blind bore formed in one of said members;
a helical metal coil of mutually adjoining turns of circular cross-section received in said bore and fused to the wall thereof to form a female thread; and
a male threaded element threaded into and removable from said female thread to retain another of said members against said one of said members.

3,910,032
INDICIA DISPLAY UNIT

Takashi Funaki, Shimosuwa, and Katuo Hashimoto, Iida, both of Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan

Filed Oct. 3, 1973, Ser. No. 402,884
Claims priority, application Japan, Oct. 5, 1972, 47-100161
Int. Cl. G04b *19/02*
U.S. Cl. 58—125 C 5 Claims



1. An indicia display unit comprising, in combination, an inner wheel bearing a series of indicia on its peripheral surface; an outer wheel telescoped coaxially over said inner wheel and bearing a series of indicia thereon equal to the number of indicia on said inner wheel and carrying a display window interposed between the two terminal indicia of its series; a common shaft rotatably mounting said inner and outer wheels; respective external gear means on said inner and outer wheels and fixed to rotate therewith; drive means operable to step the gear means of said inner and outer wheels through regular angular intervals, each corresponding to one indicia position of the respective wheel, at regular time intervals; said drive means stepping the gear means of said inner

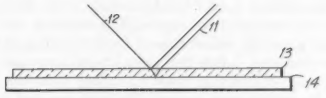
wheel through two revolutions per cycle; and locking and release means operable cyclically by said inner wheel to lock the gear means of said outer wheel against rotation by said drive means, and to uncouple said outer wheel gear means therefrom, at the beginning of the first revolution of said inner wheel, and to release the gear means of said outer wheel, and to couple said outer wheel gear means to said drive means, for rotation by said drive means, at the beginning of the succeeding revolution of said inner wheel; said locking and release means being operated by said inner wheel gear means to lock the gear means of said outer wheel against rotation simultaneously with movement of said display window into a display position with one terminal indicia of the series on said inner wheel aligned with said display window; said inner wheel gear means operating said locking and release means to release the gear means of said outer wheel and to rotate said outer wheel gear means into driving connection with said drive means for rotation by said drive means, in synchronism with rotation of said inner wheel gear means, as the other terminal indicia of the series on said inner wheel is moved past said display window at the end of the first revolution, of each cycle, of said inner wheel; said gear means of said outer wheel having a hiatus which, in the locking position of said locking and release means, interrupts driving connection of said drive means to the gear means of said outer wheel.

3,910,033

WATCH DIAL WITH INTERFERENCE COLORS

Yoshinori Saito, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 319,087, Dec. 29, 1972, abandoned. This application Jan. 16, 1975, Ser. No. 541,677
Claims priority, application Japan, Dec. 29, 1971, 46-725
Int. Cl.² G04B *19/06*
U.S. Cl. 58—127 R **2 Claims**



1. A watch dial of improved appearance, comprising a dial of brass, a layer of black chromium thereon and an adherent transparent coating of sapphire on said layer, said coating being of a thickness such as to produce color by interference between light reflected from the exterior surface of said layer and the exterior surface of said coating.

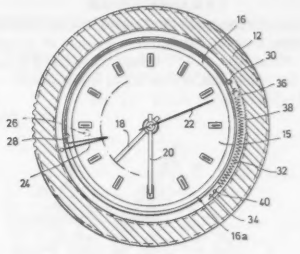
3,910,034

ALARM DEVICE FOR A WRISTWATCH EXTERNAL TO THE MOVEMENT

Wilhelm Paul Tilse, Birkenfeld, Germany, assignor to Timex Corporation, Waterbury, Conn.

Filed Apr. 4, 1975, Ser. No. 509,389
Int. Cl.² G04B *23/02, 39/00*
U.S. Cl. 58—152 B **6 Claims**

1. An alarm device for a watch, especially a wristwatch, with a movement for driving a staff with a hand thereon, a movement case with an open side and a cap covering the open side of the movement case, said alarm device having a rotatable setting ring associated with cap, spring means disposed between the movement case and the setting ring, one-way clutch means arranged to allow rotation of the setting ring and spring means in one direction and to hold the spring means in tension from the movement case when the setting ring is rotated in the other direction, and release means for holding



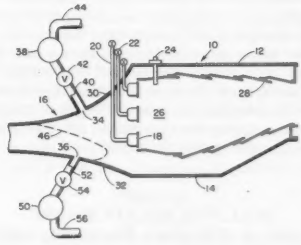
the spring means in tension and releasing the setting ring at a selectable time.

3,910,035

CONTROLLED SEPARATION COMBUSTOR

Albert J. Juhasz, Parma, and Richard W. Niedzwiecki, Brunswick, both of Ohio, assignors to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed May 24, 1973, Ser. No. 363,691
Int. Cl.² F02C *9/14*
U.S. Cl. 60—39.23 **5 Claims**



1. A short annular combustor for a gas turbine comprising a pair of spaced axially extending walls forming a full annulus, an annular liner mounted in said annulus forming a combustion chamber,

a plurality of nozzles mounted at one end of said combustion chamber,

means for supplying fuel to said nozzles,

a diffuser adjacent to said nozzles for supplying air to said annulus thereby forming a combustible mixture with said fuel, the end of the annular liner adjacent to said nozzles is open whereby air from said diffuser flows around said nozzles thereby creating a low velocity recirculation space adjacent to each of said nozzles, said diffuser having an asymmetric geometry formed by a rapidly diverging outer wall and a gradually diverging inner wall terminating at said axially extending walls adjacent to said nozzles,

a plurality of circumferentially spaced bleed ports in at least one of said diverging walls for selectively removing a small fraction of the diffuser inlet airflow through at least one of said diverging walls to control the airflow distribution at various operating conditions of the turbine,

at least one manifold,

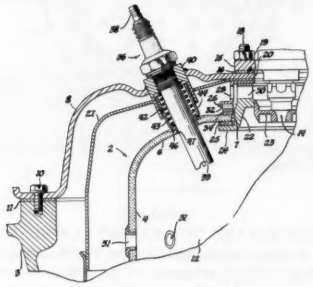
means for connecting said bleed ports to said manifold, and

a plurality of valves for selectively controlling the bleed flow of air through said ports to said manifold thereby controlling the circumferential airflow distribution.

3,910,036
IGNITER INSTALLATION FOR COMBUSTOR WITH CERAMIC LINER

John A. Irwin, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1974, Ser. No. 458,075
Int. Cl.[2] F02C 7/20, 7/26; F16L 55/00
U.S. Cl. 60—39.32 6 Claims

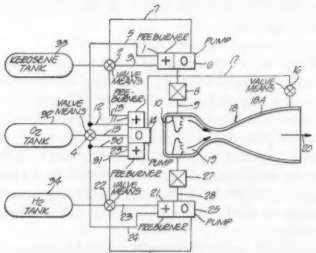


4. A combustion apparatus for a gas turbine engine comprising, in combination, a housing, a combustion liner having a wall of ceramic material fixedly mounted within the housing, means for supplying fuel to the liner for combustion, and igniter means for igniting the fuel extending from outside the housing into the interior of the liner, the liner wall having a hole for admission of the igniter means, in which the improvement comprises an annular boss extending from the housing, an annular plunger slidably supported by the boss and surrounding the igniter means outside the liner, a gasket disposed between and engaging the plunger and the ceramic liner wall outer surface around the igniter admission hole to control entrance of air into the liner around the igniter means through the hole, and a spring reacting against the boss and plunger biasing the plunger against the gasket.

3,910,037
DUAL FUEL ROCKET ENGINE

Robert J. Salkeld, 5921 Floris Heights Rd., Malibu, Calif. 90265

Filed July 30, 1973, Ser. No. 383,814
Int. Cl. F02k 9/06
U.S. Cl. 60—250 8 Claims

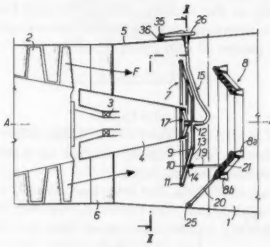


1. A chemical rocket engine, said engine having a single thrust chamber, said engine having a first means to feed and effect combustion of a first propellant combination in said thrust chamber to effect a first mode of propulsion in the atmosphere for a sustained long time duration to effect propulsion of said engine for a substantial long distance through the atmosphere, said engine having a second means to feed and effect combustion of a second propellant combination in said thrust chamber to effect a second mode of propulsion in the atmosphere for a sustained long time duration to effect propulsion of said engine for a substantial long distance through the atmosphere, and third means for preventing simultaneous operation of said first means and said second means.

3,910,038
AFTERBURNER FUEL INJECTION DEVICES FOR JET ENGINES

Guy Pierre Florentin Bourdereau, Melun, and Andre Alphonse Mederic Leon Camboulives, Savigny-sur-Orge, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Apr. 26, 1974, Ser. No. 464,451
Claims priority, application France, Apr. 27, 1973, 73.15347
Int. Cl.[2] F02K 3/10; F02C 7/20
U.S. Cl. 60—261 10 Claims



1. In a jet engine comprising a turbine having a rear bearing, an afterburner duct, a central mounting fixed on the axis of said duct, means mounting the rear bearing in the central mounting, a flame holder fixed coaxially in the duct, an afterburner fuel injection arrangement comprising an injection device of generally wheel-shaped form including at least one circular manifold, a hub and pipes connecting said manifold to said hub, connecting links extending from the injection device for attachment to said flame holder and permitting movement of said hub relative to said flame holder, an aperture in the central mounting to receive the hub for relative axial slidable movement of the hub, a feedpipe of gooseneck form connected to said hub for supplying fuel by way of said hub to said manifold, and means for carrying the feedpipe through the afterburner duct wall permitting longitudinal and lateral movement of the feedpipe with respect to said duct wall.

3,910,039
ROCKET CHAMBER AND METHOD OF MAKING

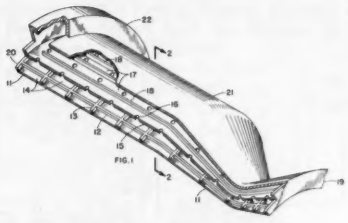
Anthony Fortini, Cleveland, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 289,050, Sept. 14, 1972, Pat. No. 3,832,920. This application Jan. 24, 1974, Ser. No. 436,316
Int. Cl.[2] F02K 9/02, 11/02
U.S. Cl. 60—265 1 Claim

1. A rocket chamber comprising:
an inner annular wall of porous material, wherein said inner annular wall is tightly woven wire bonded at points of contact, said wire being selected from the group of metals consisting of stainless steel, bronze and copper;
a network of annular and longitudinal ribs disposed outwardly of said wall and bonded thereto;
an interchamber wall disposed outwardly of said ribs and bonded thereto to form distribution cavities, at least one

metering orifice being located in said interchamber wall at every distribution cavity,

a plurality of parallel longitudinal ribs disposed outwardly of said inter chamber wall and bonded thereto;



an outer annular jacket bonded to said longitudinal ribs and defining with said longitudinal ribs and said inter chamber wall a plurality of distribution manifolds; and

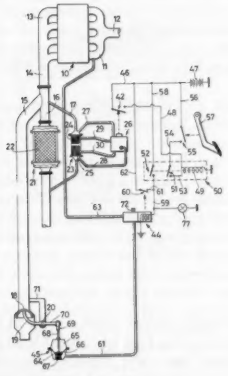
a feed manifold bonded to the front of said rocket chamber and communicating with said distribution manifolds.

3,910,040

DEVICE FOR DETECTING THE OVERHEATING OF A CATALYST TRAVERSED BY THE EXHAUST GAS OF AN EXPLOSION ENGINE

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Feb. 26, 1974, Ser. No. 445,904
Claims priority, application Italy, Feb. 28, 1973, 21040/73
Int. Cl.² F01N *3/14*
U.S. Cl. 60—277 **14 Claims**



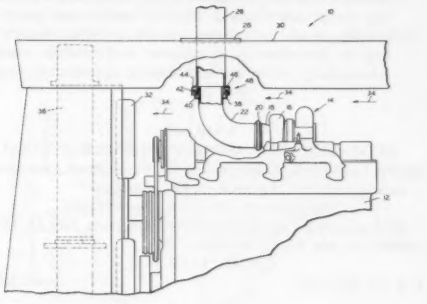
1. In an exhaust system for an internal combustion engine, particularly for motor vehicles, provided with at least one muffler for the post combustion of the engine exhaust gas, a device for detecting excessive overheating of a catalyst contained in said muffler, said device comprising a first and second cell disposed in series and traversed by the engine exhaust gas, said cells containing solid but not compact material and hence being traversable by the gas, the gas undergoing a first and second pressure drop in said cells, the material contained in the second cell being a catalytic material, said detector device further comprising means sensitive to the pressure drops undergone by the gas in traversing said cells, a signal being supplied by said sensitive means when, for a determined overheating in said second cell, the pressure drop undergone by the gas in traversing said second cell exceeds a predetermined value.

3,910,041

TURBO-SUPERCHARGER EXHAUST

Ira J. Gibson, St. Joseph, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed May 6, 1974, Ser. No. 467,170
Int. Cl.² F01N *5/04*
U.S. Cl. 60—280 **2 Claims**



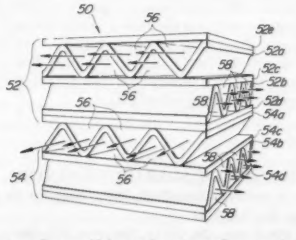
1. An exhaust construction for a turbo-supercharger on an engine, having a wall adjacent the engine through which exhaust gases are discharged, comprising a first rigid conduit member connected to and extending away from the turbo-supercharger and having an upwardly extending terminal portion, a baffle portion attached to the outer extremity of the said first conduit member forming a reservoir, a liquid in said reservoir, a second rigid conduit member secured to and extending through the wall, the said second conduit member aligned with the said first conduit member for receiving exhaust gases therefrom and transmitting them through the wall, and the entrance end of the second conduit member extending downwardly into the said liquid, whereby to provide a non-rigid connection between the said first and second conduit members and a seal for preventing the escape of exhaust gases.

3,910,042

SYSTEM FOR PURIFYING EXHAUST GAS FROM AN INTERNAL COMBUSTION ENGINE

Haruki Yuge; Masami Oki, both of Nagoya, and Naoto Miwa, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed May 4, 1973, Ser. No. 357,268
Claims priority, application Japan, May 8, 1972, 47-45244
Int. Cl.² F01N *3/14*
U.S. Cl. 60—286 **13 Claims**



1. A system for purifying exhaust gas from an internal combustion engine, said system comprising:

a. a catalytic reactor including a housing and a catalytic reaction bed disposed therein, said bed including a plurality of side walls defining therein first and second groups of passages arranged in heat-exchange relationship, the

walls of said first group of passages extending at an angle with respect to the walls of said second group of passages, said angle being at least greater than zero degrees, and said first group of passages being adapted to pass only the exhaust gas therethrough;

b. means on said catalytic reactor for detecting the temperature in said bed and producing a signal representing the detected temperature, and

c. means operable in response to the signal from said temperature detecting means to supply temperature controlling air to said catalytic reactor, said second group of passages in said bed passing only the temperature controlling air therethrough to maintain said catalytic reactor substantially within a predetermined temperature range.

3,910,043

HYDRAULIC TRANSMISSION CONTROL SYSTEM

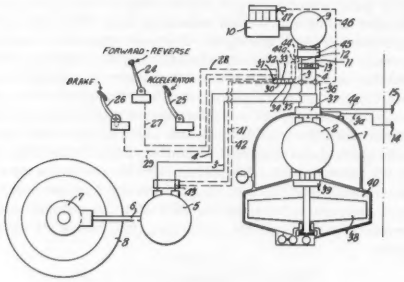
Robert Cecil Clerk, Edison House, Fullerton Road, Queensway Industrial Estate, Glenrothes, Fife, Scotland

Filed July 23, 1974, Ser. No. 490,927

Claims priority, application United Kingdom, July 23, 1973, 34909/73; July 18, 1974, 34909/74

Int. Cl.[2] F15B *1/02*

U.S. Cl. 60—413 **4 Claims**



1. An energy-accumulating system for use in a vehicle; said system including:

a flywheel (**38**) for rotating stored energy;

a first hydraulic pump/motor (**2**) for rotating with said flywheel (**38**);

a ground engaging wheel (**8**);

a second hydraulic pump/motor (**5**) for rotating with said wheel;

control means (**30**) responsive to signals applied thereto for selectively controlling the flow of fluid between said first and second hydraulic pump/motors so that the energy stored in said flywheel (**38**) can be controlled in relationship to an operator control and the speed of rotation of said ground engaging wheel (**8**).

3,910,044

HYDRAULIC SUMMATING SYSTEM

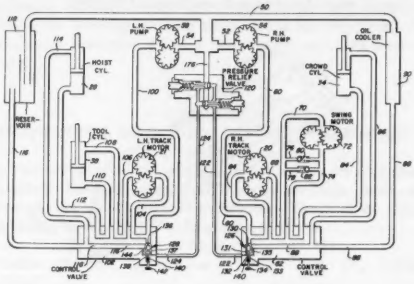
William D. Symmank, Schofield, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Aug. 24, 1973, Ser. No. 391,064

Int. Cl.[2] F15B *13/09*

U.S. Cl. 60—420 **11 Claims**

7. A summating valve assembly for controlling the fluid under pressure in systems supplied by fixed displacement pumps including a relief valve for each of said pumps, which valves are responsive to the fluid under pressure emanating from all of said pumps, sid valves controlling the flow of fluid between the outlet and inlet of said pumps to relieve the



pressure in the systems when the summated outlet pressures of said pumps exceed the maximum allowable pressure.

3,910,045

HYDRAULIC CONTROL APPARATUS FOR HYDRAULIC-LIFT END GATES OF MOVING VANS AND THE LIKE

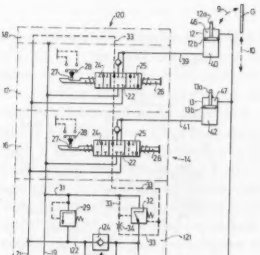
Walter Herrmann, Vaihingen, Enz, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Dec. 12, 1973, Ser. No. 422,596

Claims priority, application Germany, Jan. 13, 1973, 2301607

Int. Cl.[2] F16D *31/02*

U.S. Cl. 60—433 **5 Claims**



1. In a hydraulic control apparatus for at least one double-acting consumer of the type wherein at least one control valve includes at least one valve member movable between first operative, second operative and neutral positions to thereby respectively connect a first fluid-conveying line of said consumer with a supply conduit which is connected to a source of pressurized fluid, with a return conduit which is connected to a tank, and to seal said first line from said conduits, and wherein said valve member of said control valve controls the flow of fluid in a control conduit for a switchover valve which opens in response to fluid flow in said control conduit to provide a path for the flow of pressurized fluid from said supply conduit into a second fluid-conveying line of said consumer, and wherein pressure-regulating means is connected between the outlet of said switchover valve and said tank and is operative for regulating the pressure of fluid in said second fluid-conveying line of said consumer, the improvement consisting in that said pressure-regulating means comprises a flow restrictor connected between the outlet of said switchover valve and said tank and a check valve connected in parallel to

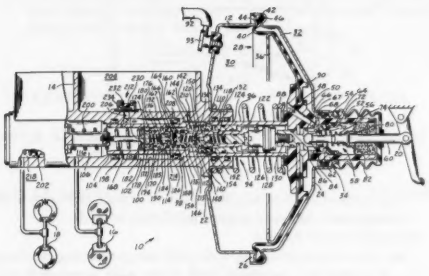
said flow restrictor with such an orientation as to permit flow of fluid from said tank into said second fluid-conveying line of said consumer.

3,910,046

TWO STAGE SERVOMOTOR

Delbert J. Gardner; William C. Sisco; Frederick G. Grabb, and Carl D. Owens, all of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Oct. 2, 1974, Ser. No. 511,413
Int. Cl.[2] F15B *7/00*
U.S. Cl. 60—553 **10 Claims**



1. In a power braking system having a piston means moved by a wall means which responds to a valve means operated by an input force, said piston means producing a first fluid force in a first mode of operation and a second fluid force in a second mode of operation, said valve means permitting a volume of fluid to be communicated from the braking system to a relief chamber proportional to the input force to develop the second mode of operation, control means associated with the piston means for preventing fluid communication between the second mode of operation and the first mode of operation with a reduction in the input force until compensatory fluid is provided to the braking system for said volume of fluid communicated to the relief chamber, said control means comprising:

a housing having a bore therein with a first diameter and a second diameter, said piston means dividing the first diameter into a first pressurizing chamber and said relief chamber, said piston means extending into said second diameter of said bore to form a second pressurizing chamber therein, said housing having a port means connected to a source of fluid to said first diameter of said bore, said piston means having a first axial bore therethrough with a first radial opening connected to the first pressurizing chamber and a second radial opening connected to the first pressurizing chamber and a second radial opening connected to the relief chamber, first valve means located in the first axial bore of said piston means between the first radial opening and the second radial opening for preventing communication between the first pressurizing chamber and the relief chamber while allowing communication between the first pressurizing chamber and the second pressurizing chamber in said first mode of operation and for interrupting the communication between the first pressurizing chamber and the second pressurizing chamber while allowing communication between the first pressurizing chamber and the relief chamber in said second mode of operation; and

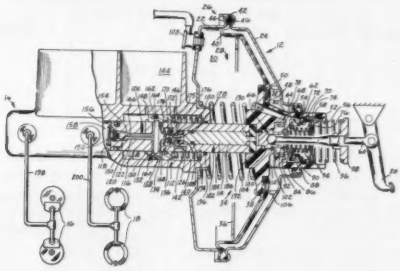
second valve means located in said first axial bore of the piston means between the first radial opening and the outlet to the second pressurizing chamber for allowing said first fluid force to be freely communicable between the first pressurizing chamber and the second pressurizing chamber in said first mode of operation and for preventing communication between the second pressurizing chamber and the first pressurizing chamber in the second mode of operation in response to a pressure differential being developed between the first fluid force and the second fluid force in the second mode of operation.

3,910,047

TWO STAGE SERVOMOTOR WITH SMOOTH ACTUATION SEQUENCE

Frederick G. Grabb, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed June 20, 1974, Ser. No. 481,432
Int. Cl.[2] F15B *7/00, 7/08*
U.S. Cl. 60—554 **10 Claims**



1. In a power braking system having a servomotor with a wall moved by a pressure differential acting thereacross for supplying an operational force to activate the wheel brakes in response to an input force in a first mode of operation, control means for modifying the operational force in response to an input force in a second mode of operation, said control means comprising:

a housing having a bore therein with a first diameter section connected to a reservoir by a first port and a second port and a second diameter section connected to said wheel brakes;

first piston means connected to said wall and extending through said first diameter section to establish an output chamber in the second diameter section, said output chamber being connected by an axial flow path to the first diameter section through a first axial passage and a second axial passage, said axial flow path having a control chamber located between the first axial passage and the second axial passage;

second piston means concentric to and located between a first stop and a second stop on the first piston means for separating the first diameter section into a pressurizing chamber and a relief chamber;

resilient means connected to the first piston for urging said second piston means toward said first stop;

first valve means located with said axial flow path for controlling communication between the pressurizing chamber and the output chamber;

second valve means located within said axial flow path for controlling communication between the pressurizing chamber and the relief chamber;

first actuator means located within the axial flow path and moved away from the first valve means when the first pressurizing force moves the second piston means against the second stop in opposition to the resilient means during the first mode of operation, said first pressurizing force opening said first valve means to supply the wheel brakes with an actuation force; and

second actuator means responsive to said input force in the second mode of operation to move the second valve allowing said first pressurizing force present in the pressurizing chamber to proportionally escape into the relief chamber as a function of the input force and allow the pressure differential force acting on the wall to move the first piston in the output chamber to develop a second pressurizing force for activating the wheel brakes in the

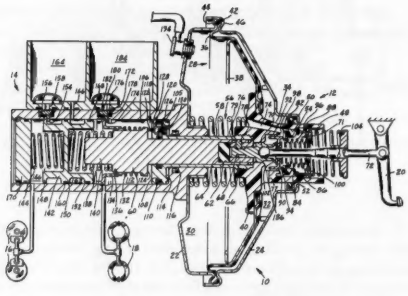
second mode of operation, said resilient means moving said second piston toward said first stop upon termination of said second mode causing said first actuator means to open said first valve means and establish unhampered communication between the output chamber and the pressurizing chamber.

3,910,048

HYDRAULIC LOCK FOR HYDRAULIC RATIO CHANGER

Delbert J. Gardner, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed June 20, 1974, Ser. No. 481,434
Int. Cl.[2] F15B *7/00, 7/08*
U.S. Cl. 60—568 **10 Claims**



1. In a power braking system having a servomotor through which a first operational force is supplied to a brake energizer from the simultaneous movement of a plurality of concentric pistons in response to an input force, means for permitting one of said pistons to supply an additive operational force to said brake energizer when one of the pistons moves independently of the other pistons, said means comprising:

chamber means connected by a passage to receive an output signal from said brake energizer;

valve means located in said passage for controlling the communication of said output signal to said chamber means; and

actuator means connected to said one of said pistons and said valve means to prevent said output signal from being communicated to said chamber means upon independent movement of said one piston, said valve means retaining said output signal within said chamber means to hold the remaining pistons stationary in said bore while said input force is transmitted through said one of said pistons to establish an increased output signal.

3,910,049

FUEL TRAP EVACUATION SYSTEM

Richard J. Lloyd, Huntington Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jan. 30, 1974, Ser. No. 438,093
Int. Cl.[2] F02B *33/44*
U.S. Cl. 60—605 **6 Claims**

1. In combination:

an internal combustion engine for burning a mixture of liquid fuel and air to produce useful power and heated exhaust gases, said engine having inlet means for receiving a fuel-air mixture and an outlet for discharging the heated exhaust gases;

a carburetor for mixing liquid fuel and air;

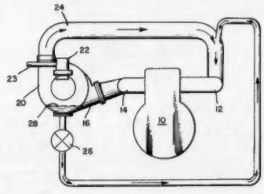
supply conduit means connected between said carburetor and said engine inlet;

a turbocharger having:

a turbine connected to said engine outlet so as to be driven by the heated exhaust gases from said engine, and

a compressor connected in said supply conduit means to receive a mixture of liquid fuel and air from said carburetor, compress such mixture, and deliver the compressed mixture to said engine inlet means;

said compressor and said engine inlet means being oriented such that liquid fuel being supplied by said compressor travels upwardly to reach said engine inlet such that portions of said liquid fuel tend to collect in a sump-defining portion of said supply conduit means between said compressor and said engine inlet means; and



pumping means having:

an inlet communicating with said sump-defining portion, a pump for pumping fuel from said sump-defining portion, and

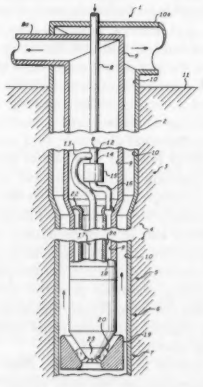
an outlet communicating with said supply conduit means for directing said pumped fuel into a downstream portion of said supply conduit means at a location where the remaining extent of said supply conduit means is oriented to exclude subsequent upward travel of fuel to said engine inlet.

3,910,050

GEOTHERMAL ENERGY SYSTEM AND CONTROL APPARATUS

Hugh B. Matthews, Acton, Mass., and Kenneth E. Nichols, Arvada, Colo., assignors to Sperry Rand Corporation, New York, N.Y.

Filed July 10, 1974, Ser. No. 487,429
Int. Cl.[2] F03G *7/00;* **F01K** *23/00*
U.S. Cl. 60—641 **10 Claims**



1. In geothermal deep well pumping apparatus located at a subterranean source of geothermal well fluid of the kind including geothermal energy exchange means for providing a working fluid and motor driven pump means responsive to said working fluid for pumping said geothermal fluid always in liquid state for flow in cooperative energy exchange relation

with respect to said geothermal exchange means toward the earth's surface:

threshold valve means for passing a first liquid to threshold valve output means when under a predetermined pressure above the pressure of said geothermal fluid,

differential pressure valve means for receiving said first liquid from said threshold valve output means and for maintaining a substantially constant pressure differential between said received first liquid and the pressure of said first liquid at said differential pressure valve output means, and

distributor conduit means of said first liquid at said differential pressure valve output means coupled to said geothermal energy exchange means for supplying said working fluid to said motor driven pump means.

3,910,051

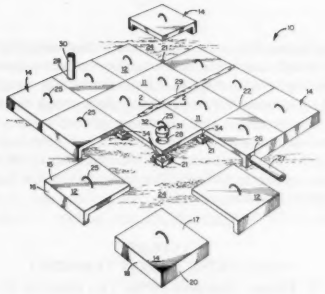
LEACHING SYSTEM CAVITY OF PREFORMED COMPONENTS

Joseph A. Komisarek, Amherst Road, Bedford, N.H. 03102

Filed May 3, 1974, Ser. No. 466,807

Int. Cl.² E02B *11/00*

U.S. Cl. 61—11 **10 Claims**



1. A leach field construction for distributing fluid waste comprising:

a. a leach bed;

b. a plurality of discrete roof elements positioned adjacent each other over said leach bed;

c. a plurality of discrete side elements each having roof portions and wall portions positioned around and adjacent to said roof elements;

d. a plurality of discrete support elements positioned under each four-way conjunction of said roof elements and said side elements for supporting each said conjunction at a level with said wall portions, said roof, side and support elements being arranged to provide a single roofed cavity;

e. an entrance line connected through one of said elements for ingress of fluid waste to said cavity; and,

f. sealing means for preventing passage of material downward between the interstices of adjacent ones of said roof elements and between adjacent ones of said side elements.

3,910,052

IRRIGATION CANAL, WATER-WITHDRAWAL WEIR

Carrol G. Whitlock, 841 Grand Dr., Moses Lake, Wash. 98837

Filed Feb. 21, 1974, Ser. No. 444,536

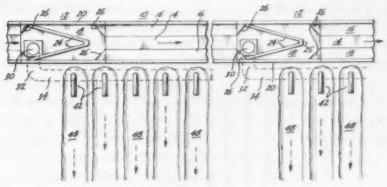
Int. Cl.² E02B *13/00*

U.S. Cl. 61—12 **6 Claims**

1. For use in an irrigation system in which, alongside a substantially water-tight canal, there is a distributor conduit having a plurality of spaced-apart tubes, each associated with a field corrugation and operable to withdraw and direct water from said conduit to flow as a rill in the associated corrugation, the improvement, comprising:

wall means forming a weir in such canal adjacent the upstream end of said distributor conduit, said weir having an enlarged cross-section relative the cross-section of said canal;

a bifurcated vee-shaped water check pointed downstream in said weir and formed of walls rising from the bottom of



said weir to a height less than the height of said weir, said bifurcated water check being operable to substantially retard the flow of water through said weir;

said weir having a valved outlet in its bottom located adjacent the upstream end of said bifurcated water check;

valve-actuating means operable to open and close said valved outlet to control water flow therethrough; and

conduit means connecting between said outlet and said distributor conduit.

3,910,053

SHEETING ARRANGEMENT FOR SHORING A TRENCH WITH A GRADUATED CROSS SECTION

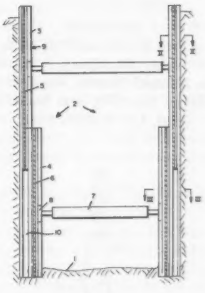
Josef Krings, Hans-Bockler-Str. 23, D 5138 Heinsberg, Oberbruch, Germany

Filed Jan. 8, 1974, Ser. No. 431,788

Claims priority, application Germany, Jan. 17, 1973, 2302053

Int. Cl.² E21D *19/00*

U.S. Cl. 61—41 A **9 Claims**

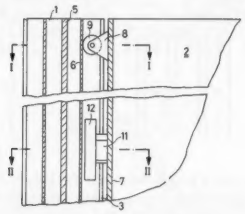


1. A sheeting arrangement for shoring trenches, said sheeting arrangement being of a stepped cross section and comprising a plurality of sets of inner and outer posts, said outer post and said inner post of each set being in vertically overlapping interconnected relation, said sets of posts being in aligned pairs transversely of a trench and being spaced longitudinally thereof, upper and lower sheeting walls extending between longitudinally adjacent sets of said posts with said upper sheeting wall extending between said outer posts and said lower sheeting wall being inwardly offset from said upper sheeting wall and extending between said inner posts, and spreader devices extending transversely between transversely aligned pairs of said sets of posts for firmly retaining said posts against side walls of the trench.

3,910,054
SHEETING ARRANGEMENT FOR SHEETING OF A DITCH

Josef Krings, Oberbruch, Hans-Bockler-Str. 23, D-5138 Heinsberg, Germany

Filed Apr. 26, 1974, Ser. No. 464,459
Claims priority, application Germany, May 9, 1973, 2323321
Int. Cl.[2] E21D 5/00
U.S. Cl. 61—41 A 4 Claims

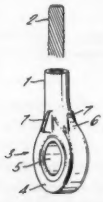


1. An apparatus comprising sheeting means for the shoring of ditches, said sheeting means including vertical posts of a hollow box-like profile, sheeting walls, and guide heads carried by each of said sheeting walls in vertically spaced relation and guided in said posts, each post having at least one leg disposed normal to the plane of an adjacent one of said sheeting walls and inner and outer legs disposed parallel to the plane of adjacent ones of said sheeting walls, said guide head having a plurality of rollers, some of said rollers being mounted for rotation on axes disposed normal to the plane of a respective sheeting wall in engagement with said one leg and others of said rollers being mounted for rotation on axes extending within the plane of the respective sheeting wall between side surfaces thereof and perpendicular to an adjacent post, said other rollers being offset relative to the respective sheeting wall such that they run only on said inner leg of the respective post which inner leg will be adjacent to the center of a ditch being shored.

3,910,055
CABLE ATTACHMENTS

Brian Edgar Lund Biram, Randburg, South Africa, assignor to C.C.L. Systems Limited, Surrey, England

Filed May 28, 1974, Ser. No. 473,546
Int. Cl.[2] F16G 11/00
U.S. Cl. 61—45 2 Claims

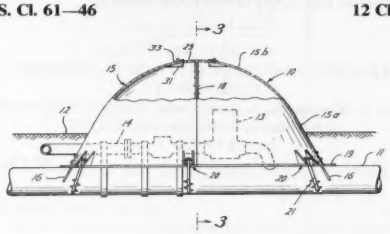


1. A cable anchor element having a socket at one end for receiving only a straight portion of a cable end therein and a load supporting member at the other end, said cable support element including an intermediate section that includes a plurality of radially extending members which gently converge from a widest point adjacent said load supporting member to a narrowest point surrounding said socket, said cable anchor element being securable in a recess of a wall with said socket end inserted in said recess and said radially extending members of said intermediate section secured in the mouth of said recess so that said load supporting member is exposed to support an external member adjacent said wall, said supporting element comprises at least two hook members, said hook member being rooted to said intermediate sections with said hook members converging gently toward a narrowest point surrounding said socket.

3,910,056
APPARATUS FOR PROTECTING UNDERWATER EQUIPMENT

Emil E. Dopyera, 2200 S. Post Oak, Houston, Tex. 77027

Continuation-in-part of Ser. No. 194,832, Nov. 2, 1971, abandoned. This application July 2, 1973, Ser. No. 375,469
Int. Cl.[2] E02D 29/12
U.S. Cl. 61—46 12 Claims

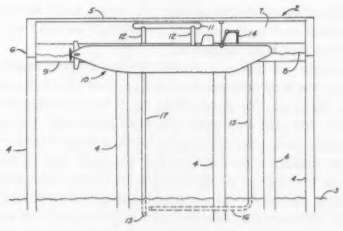


1. Apparatus for protecting underwater equipment, comprising a hood adapted to be lowered over the equipment, said hood having a plurality of circumferentially spaced-apart upwardly and outwardly tapering wedges about its lower end, each wedge having a slot extending inwardly from its outer end to receive an anchor, and a plurality of plates each having a slot on its inner end and slidable over the upper side of a wedge to cooperate with the slot in the wedge for holding the anchor therebetween.

3,910,057
SUBMARINE CARGO TERMINAL

George E. Fenton, Newport News, Va., assignor to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.

Filed Aug. 16, 1974, Ser. No. 497,980
Int. Cl.[2] B63C 11/00; B63B 21/00
U.S. Cl. 61—46 1 Claim



1. A terminal for submarine vessels comprising:
a structure fixed entirely beneath the surface of a body of water;
said structure containing a space empty of water open on at least one side to the body of water;
the pressure in said space being at the same pressure as the surrounding water such that said water is excluded from said space;
pier means on the surface of the water in said space;
means for loading and unloading cargo from said submarine vessel in said space;

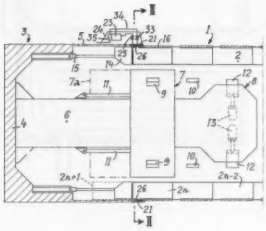
and means giving humans access to the exterior of said submarine vessels in said space.

3,910,058

CONSTRUCTION OF IMMERSED STRUCTURES

Paul H. Fouillade, Neuilly-sur-Seine, France, assignor to Dumex Travaux Publics, Nanterre, France, a part interest

Filed July 2, 1974, Ser. No. 485,102
Claims priority, application France, July 5, 1973, 73.24817
Int. Cl.² E21D *9/24*
U.S. Cl. 61—85 **7 Claims**



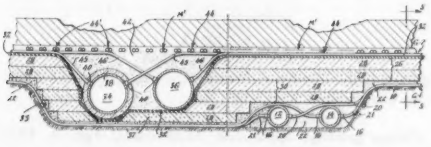
1. In a method of constructing in a substantially normal atmosphere a linear structure immersed in a fluid in which method a portion of the structure to be added to previously formed such structure is constructed within a tubular caisson shield having a portion surrounding and spaced from said previously formed structure to provide a space between said shield and said lastmentioned structure and extending around the latter, the step of sealing said shield to said last-mentioned structure by introducing into said space a liquid which can be made solid by cooling and by cooling said liquid until it is solid.

3,910,059

METHOD AND SYSTEM FOR PROVIDING AN ICE SLAB WHILE PREVENTING UNDUE FREEZING PENETRATION BELOW

Calvin D. MacCracken, Englewood, N.J., assignor to Calmac Manufacturing Corporation, Englewood, N.J.

Filed Apr. 22, 1974, Ser. No. 462,718
Int. Cl.² F25D *17/02*
U.S. Cl. 62—99 **18 Claims**



6. The method of creating and maintaining an ice slab such as for a skating rink, ice chute or the like and for preventing heaving damage caused by freezing and expansion of ground moisture under the ice slab, said method comprising the steps of:

providing an area of ground,

overlaying said area of ground with a first grid of parallel lengths of flexible tubing and providing first supply and return header pipes for said first grid,

overlaying said first grid with a layer of insulation material,

overlaying said insulation material with a waterproof liner,

overlaying said waterproof liner with a second grid of parallel lengths of flexible tubing and providing second supply and return header pipes for said second grid,

putting water over said waterproof liner to be frozen into an ice slab,

circulating antifreeze liquid through said second header pipes and said second grid,

refrigerating said antifreeze liquid to a temperature below the freezing temperature of water by extracting heat energy from this antifreeze liquid for freezing the water in said ice slab,

circulating antifreeze liquid through said first header pipes and said first grid,

warming said latter antifreeze liquid to a temperature above the freezing temperature of water to prevent freezing and expansion of ground moisture under said ice slab thereby to prevent heaving damage.

17. A system for creating and maintaining an ice slab for use as a skating rink, ice chute, or the like and for preventing damage caused by penetration of undue cold into the region under the ice slab, said system comprising:

first supply and first return header means,

a first grid of parallel lengths of flexible tubing overlaying the area of ground where said ice slab is to be formed, one end of each length of said tubing being connected to said first supply header means, the other end of each length of said tubing being connected to first return header means, said first supply and return header means and said first grid being adapted to circulate antifreeze liquid therethrough,

insulating means overlaying said first grid,

waterproof liner means overlaying said insulating means for holding water,

second supply and second return header means,

a second grid of parallel lengths of flexible tubing overlaying said waterproof liner means, one end of each length of said tubing being connected to said second supply header means, the other end of each length of said tubing being connected to said second return header means, said second supply and return header means and said second grid being adapted to circulate antifreeze liquid therethrough,

first pump means for circulating antifreeze liquid through said first supply header means, said first grid, and said return header means,

second pump means for circulating antifreeze liquid through said second supply header means, said second grid, and said return header means,

refrigeration means for extracting heat from the antifreeze liquid circulated by said second pump means to cool it below the freezing temperature of water, and

heat exchange means associated with said refrigeration means for heating the antifreeze liquid being circulated by said first pump means to a temperature above the freezing temperature of water with heat extracted from the antifreeze liquid being circulated by second pump means,

whereby the antifreeze liquid circulated by said first pump means above the freezing temperature of water, prevents penetration of undue cold into the region under the ice slab, and the antifreeze liquid circulated by said second, pump means below the freezing temperature of water freezes water above said liner means into said ice slab.

3,910,060

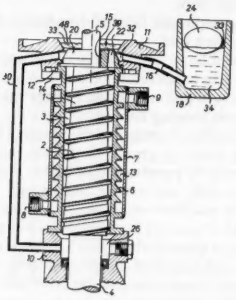
CONTINUOUSLY OPERATING ICE MAKING APPARATUS

Christian Beusch, Zollstrasse, FL-9494 Schaan, Liechtenstein

Filed June 3, 1974, Ser. No. 475,437
Claims priority, application Switzerland, June 20, 1973, 008985/73
Int. Cl.² F25C *1/14*
U.S. Cl. 62—188 **11 Claims**

1. A continuously operating ice making apparatus comprising a housing, water supply means connected to said housing for introducing water into the housing, means for cooling said housing to form slush therein, an apertured extrusion plate as

part of said housing, pressure means movably supported in said housing for compressing the slush and passing it as ice through the extrusion plate, air vent means arranged relative to said extrusion plate, and liquid heat exchange means located adjacent to said air vent means whereby an ice formation and thus clogging of said air vent means is prevented, said heat exchange means comprising a water circulating circuit including a water space adjacent to said air vent means and at least partially surrounding the surface of said extrusion plate opposite from said pressure means.



3,910,061

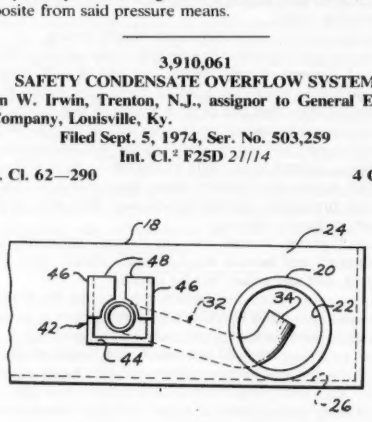
SAFETY CONDENSATE OVERFLOW SYSTEM

John W. Irwin, Trenton, N.J., assignor to General Electric Company, Louisville, Ky.

Filed Sept. 5, 1974, Ser. No. 503,259

Int. Cl.[2] F25D *21/14*

U.S. Cl. 62—290 **4 Claims**



1. In an air conditioning apparatus having a cabinet including refrigeration system evaporator means arranged in said cabinet, and drain means positioned below said evaporator for receiving condensation from said evaporator, said drain means comprising:

a base pan arranged in said cabinet including side walls;

a primary drain means arranged in the lower portion of one of said side walls having one end communicating with said base pan and its other end adapted to project beyond the outer extremities of said cabinet for directing condensate out of said cabinet;

a secondary drain tube means having a continuous side wall including an inlet end disposed in said base pan between the lower end of said primary drain means and the upper extremities of said side walls and an outlet end disposed outside of said cabinet for directing condensate from said base pan to the exterior of said cabinet when the condensate in said pan reaches the predetermined level of said inlet; and

a safety drain means including a relief drain opening located in the upper half of said secondary tube means side wall in an area outside of said base pan providing an outlet for condensate entering said inlet from said base pan when said secondary drain outlet end is closed.

3,910,062

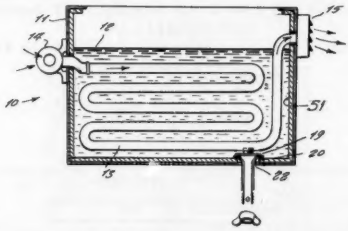
DEHUMIDIFIER

Francisco Rojas, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Aug. 7, 1974, Ser. No. 495,443

Int. Cl.[2] F25D *17/04*

U.S. Cl. 62—406 **8 Claims**



1. A dehumidifier device comprising in combination: a liquid containable vessel having an aperture in a lower portion therof and having an opening in an upperportion thereof adapted to have liquid and ice introduced therethrough into the liquid containable vessel; a tubular conduit structure having an air inlet at one end thereof and an air outlet at an opposite end thereof, mounted with the inlet and outlet substantially exterior to inner space defined within the liquid containable vessel and having a predetermined major proportion of the tubular conduit structure extending through the inner space positioned to be below liquid level when liquid is within the liquid containable vessel, a drain hole being defined in a lower wall of a portion of the tubular conduit structure positioned at a substantially lowest level relative to other portions of the tubular conduit structure such that condensed water within the tubular conduit structure is gravity-drainable through the drain hole; a drain conduit means for sealably mating at an upper open end thereof within said drain hole and the drain conduit means being further for extending sealably through said aperture of the liquid containable vessel such that condensed water is drainable therethrough to an exterior of the liquid containable vessel from within the tubular conduit structure; and an aluminum lining within said inner space lining said liquid containable vessel.

3,910,063

COOLING SYSTEM

Gijsbert Prast, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,398

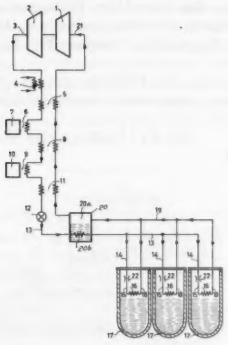
Claims priority, application Netherlands, Apr. 9, 1973, 7304885

Int. Cl.[2] F25B *19/00*

U.S. Cl. 62—514 **5 Claims**

1. In a closed system operable with a cooling fluid flowing through a continuous passage for cooling a plurality of objects, and including first means for compressing said fluid to a first high pressure, second means for cooling said fluid to a reduced temperature below the inversion temperature associated with said high pressure, a tubular cooling element with inlet and outlet means, a main supply duct for conveying said reduced temperature fluid, an auxiliary supply duct communicating each of said inlet means with said main supply duct, a main return duct communicating each of said outlet means with said first means, the improvement in combination therewith comprising Joule-Kelvin throttle valve means in said main supply duct for reducing the pressure of said fluid at said

reduced temperature before it flows to said cooling elements, and fluid flow restriction means in each of said inlet means,



said restriction means all having substantially equal internal cross-sectional areas.

3,910,064

METHOD AND APPARATUS FOR PRODUCING VARIABLE TEMPERATURE WITH THE AID OF A CRYOLIQUID

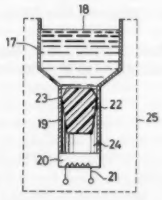
Eberhard Gmelin, and Ulrich von Alpen, both of Stuttgart, Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed Aug. 1, 1974, Ser. No. 493,523

Claims priority, application Germany, Oct. 18, 1973, 2352251; May 2, 1974, 2421102

Int. Cl.[2] F25B *19/00*

U.S. Cl. 62—514 **7 Claims**



1. Apparatus for utilizing a cryoliquid to produce variable temperatures within an evaporation chamber comprising, in combination, a supply reservoir of cryoliquid having a bottom outlet, a thermally insulated expansion chamber in communication with said bottom outlet through a conduit passage and having a lower portion, a flow resistor longitudinally movably mounted within said conduit passage controlling the flow of cryoliquid into said chamber in dependence upon the position of said flow resistor within said passage, and heating means within said chamber heating said chamber to produce a predetermined vapor pressure within said chamber for positioning said flow resistor to permit a predetermined flow of cryoliquid into said chamber to maintain a predetermined temperature within said chamber.

3,910,065

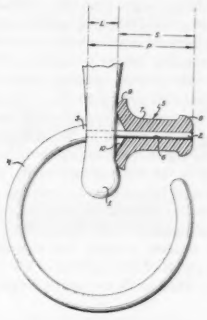
SIMPLE, SAFE, SANITARY EARRING

Edward Ellis Holt, Attleboro, Mass., assignor to Benrus Corporation, Ridgefield, Conn.

Filed May 7, 1973, Ser. No. 358,103

Int. Cl.[2] A44C *7/00*

U.S. Cl. 63—12 **2 Claims**



1. Earring comprising a pin to go inwardly through the hole in a pierced ear lobe, the pin being generally cylindrical and free of protruberances outside its essentially uniform main body diameter, a head at the outer end of the pin, and said earring also comprising a removable sleeve slidable lengthwise, without rotating, onto the free end of the pin and up against the inner face of the ear lobe, said sleeve consisting solely of a one-piece integral sleeve member with a bore of essentially a single uniform diameter extending lengthwise completely through the entire sleeve, that bore being of the same diameter as the pin and being free of inward protruberances, said sleeve being made of molded, somewhat soft, resilient plastic material with a fairly high coefficient of friction, such as polyethylene, the pin being no shorter than approximately 0.29 inch, and the sleeve being no shorter than approximately 0.25 inch, the sleeve being no longer than approximately 0.50 inch and the pin being no longer than approximately the length of the sleeve plus 0.14 inch, whereby in use with most ear lobes adequate holding is provided and at the same time the free end of the pin is contained within the sleeve and does not project therefrom toward the wearer's neck.

3,910,066

RING HAVING RECESSED STONE SECURED BY PLASTIC MATERIAL THEREUNDER

John K. Strack, 4427 E. 116th St., Carmel, Ind. 46032

Filed Feb. 26, 1974, Ser. No. 445,811

Int. Cl.[2] A44C *17/02*

U.S. Cl. 63—15 **1 Claim**

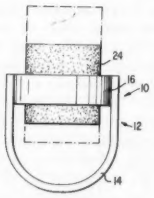
1. In a jewelry ring the combination of a ring band means, a first opening in said ring band means to accommodate the insertion of the user's finger, a second opening through said ring band means lateral to said first opening and forming a cavity to accommodate a jewelry stone, with the top portion

of said opening which is remote from said first opening being smaller than the size of the bottom of said second opening which is nearest to said first opening, a jewelry stone mounted and recessed inside the top portion of said second opening, with the top of said stone shaped so as to be similar to, mate with and be mounted against a similarly shaped and sized inside surface of the top inside of said second opening which faces said first opening and with the outside dimension of the top of said stone being larger than the inside dimension of that portion of the said second opening against which it is mounted but smaller than the said bottom inside portion of said second opening, and, securing means consisting of plastic material poured into the said second opening under and against said stone so as to bond and adhere to the underside of said stone and a portion of the walls of the said second and first openings to secure said jewelry stone in its mounted position, said securing means filling said second opening beneath said stone and being formed by the walls of said cavity, said cavity having a transverse diameter larger than its opening at said bottom so that the shape of the formed securing means is too large to pass through said bottom, with that portion of said securing means which is nearest to said first opening contoured to match and form a part of the contour of the inside of said first opening which is sized to fit the user's finger.

3,910,067
ADJUSTABLE RING WHEREIN SETTING PROVIDES ADJUSTMENT

Garry L. Rumbaugh, 601 Orkney Rd., Baltimore, Md. 21212

Filed Mar. 25, 1974, Ser. No. 454,706
Int. Cl.[2] A44C 9/02
U.S. Cl. 63—15.6 5 Claims

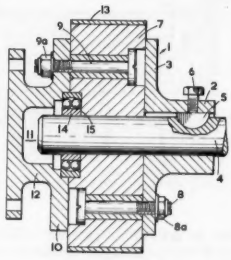


1. An adjustable ring comprising a stone, a frame comprising a substantially U-shaped band member which defines a finger receiving aperture for the finger of a wearer of the ring, and means for adjustably mounting said stone in said frame for simple axial movement in and out of said aperture perpendicular to the finger of the wearer so that the amount that the innermost end of said stone extends into said aperture can be changed and the innermost end of said stone can be brought into contact with the finger of the wearer, thereby varying the effective size of the ring, the least the distal ends of the legs of said U-shaped band member being substantially straight and extending parallel to the path of movement of said stone, and said mounting means comprising a mounting member which is disposed between the straight parallel ends of said band member, said mounting member having a circumferentially continuous wall defining a mounting aperture in which said stone is mounted, the plane of said mounting aperture being orthogonal to the plane of said finger receiving aperture formed by said U-shaped band member, the side walls of said stone being parallel to the path of movement of the stone and the inner walls of said mounting member defining said mounting aperture being parallel to and in sliding frictional engagement with the side walls of said stone.

3,910,068
JOINTS BETWEEN DRIVE AND DRIVEN SHAFTS

James Alexander O'Connor, deceased, late of Strathmore, Australia; by Andrew David Warne-Smith, administrator, Melbourne, Australia; by John Francis Radcliffe, administrator, and by Kathleen Mary O'Connor, administrator, both of Strathmore, Australia, assignors to O.C. Mechanical Research and Engineering Company Pty. Ltd., Melbourne, Australia

Filed Mar. 15, 1974, Ser. No. 451,558
Claims priority, application Australia, Mar. 16, 1973, 2619/73
Int. Cl.[2] F16D 3/62
U.S. Cl. 64—13 4 Claims

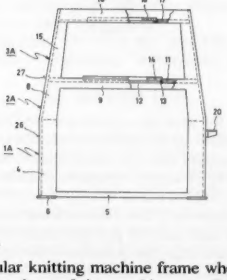


1. A joint between drive and driven shafts necessitating alignment therebetween, comprising a first and second flanged socket adapted to rigidly retain therein a drive and driven shaft respectively, an annular disc of resilient material located between said flanged sockets and rigidly connected thereto, said annular disc having means on its outer periphery to restrain radially outward movement of said disc, and means for preventing radial displacement between the drive and driven shafts including a self-aligning bearing located between said annular disc and said first flanged socket and rigidly mounted to said first flanged socket, said annular disc and bearing being adapted to receive the inner end of the driven shaft.

3,910,069
CIRCULAR KNITTING MACHINE FRAME

Emilio Llovet Ricart, Roger de Flor 16 bis,, Mataro, Barcelona, Spain

Filed Nov. 20, 1973, Ser. No. 417,507
Int. Cl.[2] D04B 9/00, 9/06
U.S. Cl. 66—8 1 Claim



1. In a circular knitting machine frame wherein the active and passive members of the machine are distributed among successive stories defined by a plurality of subframes disposed one above the other, each such subframe having a plurality of legs, and wherein the legs of the top and intermediate subframes are arranged to support a flat horizontal platform

provided with a circular opening having a recessed edge upon which is positioned a ring for supporting the operative members of the machine, the improvement comprising cross members interconnecting the legs of the lower subframe at the lower ends thereof, cross members interconnecting the legs of the adjacent intermediate subframe at the upper ends thereof, the legs of the upper, intermediate and lower subframes being positioned in unbroken external alignment with respect to each other, said legs of said upper subframe being inclined to define a frustopyramidal configuration, and the respective legs and cross members of the lower and adjacent intermediate subframes defining an opening providing direct access to the space within the subframes.

3,910,070

APPARATUS FOR CONTROLLING THE NEEDLE SELECTORS IN A CIRCULAR KNITTING MACHINE

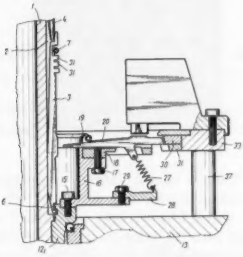
Pavel Uhlir, and Ivo Kouklik, both of Trebic, Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi, Leberec, Czechoslovakia

Filed May 31, 1973, Ser. No. 365,572

Claims priority, application Czechoslovakia, June 8, 1972, 3966-72

Int. Cl.[2] D04B *15/78*

U.S. Cl. 66—50 R **8 Claims**



1. Apparatus for distributing needle selectors in a circular knitting machine having a plurality of movable needles arranged on a rotating needle cylinder, each needle being displaced at a predetermined point along its path of rotation by operation of a jack in engagement with an associated selector, comprising means for supporting said selectors for conjoint movement with said needle cylinder, a first cam for radially directing each of said selectors in a first predefined path with respect to its associated jack and a second cam arranged adjacent said first cam and coextensive therewith at least at the predetermined point for displacing each selector into a second path radially opposite to said first path with respect to its associated jack, said first cam having a predefined contoured path adapted to maintain each of said selectors out of contact with its associated needle jack and being contoured at said predetermined point to permit transfer of said selector to said second cam, said second cam having a contoured path adapted to displace said selector into engagement with its associated needle jack, spring means biasing each selector into engagement with said first cam in a direction to force said selector to normally transfer from said first to said second cam at the predetermined point, and a selectively operable electromagnet arranged at the predetermined point adapted to act on the selectors thereat, the force generated by said electromagnet being greater than the force of said spring means so as to overcome said spring bias and maintain said selector in said first predefined path while passing said predetermined point.

3,910,071

STRAIGHT KNITTING MACHINES WITH CIRCULATING SLIDING HEADS

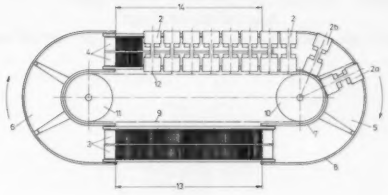
Hans Schieber, and Erich Krause, both of Bopfingen, Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

Filed Aug. 27, 1974, Ser. No. 500,962

Claims priority, application Germany, Sept. 5, 1973, 2344809

Int. Cl.[2] D04B *7/04*

U.S. Cl. 66—64 **7 Claims**



1. A straight knitting machine comprising at least two pairs of needle beds and a plurality of knitting carriages circulating over said needle beds in a continuous path extending in a closed loop for sequential cooperation of needles in said needle beds with the carriages, characterized in that the circulating knitting carriages (**2**, **2***a*, **2***b*) are kept at a specific distance from each other in the working region of the needle beds (**3**, **4**) by range spacers mounted on the carriages and are kept immovable with respect to each other at right angles to the direction of movement by guide elements mounted on the carriages and displaceable in the direction of movement.

3,910,072

METHOD OF, AND APPARATUS FOR, MAKING STITCH-BONDED FABRIC

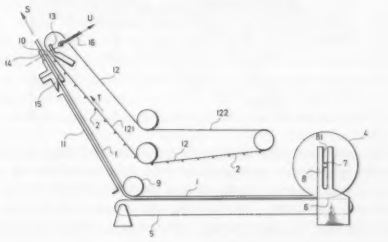
Vladimir Svoboda; Josef Skopalik, and Jaroslav Ptacek, all of Brno, Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Apr. 25, 1973, Ser. No. 354,357

Claims priority, application Czechoslovakia, Apr. 26, 1972, 2801-72

Int. Cl.[2] D04B *23/10*

U.S. Cl. 66—85 A **2 Claims**



1. A method of manufacturing a stitch-bonded fabric which includes a fibrous fleece base including transversely laid weft threads and warp threads knitted through the base by a warp knitting weave, comprising simultaneously conveying in parallel relationship but at different speeds to the operation point of a stitch-knitting machine, on the one hand, a system of weft threads and, on the other hand, a fibrous fleece base, and connecting said system of weft threads to the base at said operation point by bonding them with warp thre[illegible], the speed

of feeding the system of weft threads being higher than the speed of feeding the fibrous fleece base.

3,910,073

PROCESS AND A DEVICE FOR HOLDING THE END OF THE THREAD ON STRAIGHT KNITTING MACHINES

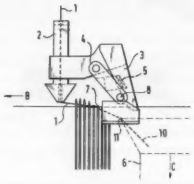
Erich Krause, and Hans Schieber, both of Bopfingen, Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

Filed May 20, 1974, Ser. No. 471,747

Claims priority, application Germany, May 21, 1973, 2325747

Int. Cl.[2] D04B *35/00*

U.S. Cl. 66—145 S **6 Claims**



1. In a process for holding a cut thread end away from the engagement zone of the needles in a straight knitting machine having a circulating carriage, the thread being drawn in an adjustable manner from a thread clamp on a thread guide which is displaced over the needle boards, the improvement comprising: the thread clamp being adjustably opened to release the clamped thread end when at least the first needle has become entangled on the entry of the carriage into the needle zone and the released thread end is sucked between the two knocking-over combs of the needle board.

3,910,074

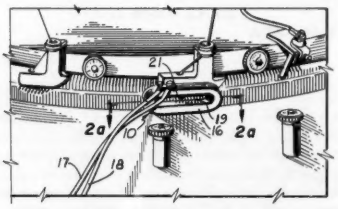
DAMAGED NEEDLE DETECTION APPARATUS

Edward I. Parker, 34 Oak Ridge Road, Holden, Mass. 01520

Filed May 16, 1973, Ser. No. 360,636

Int. Cl.[2] D04B *35/18*

U.S. Cl. 66—157 **6 Claims**



1. In combination with a knitting machine having a plurality of knitting needles arranged around the periphery of said machine and adapted to move in a peripheral path about the machine frame during the knitting operation with means at a predetermined location in said path for projecting said needles to expose the hooked end thereof as they move in sequence past said location,

a first oscillating circuit having a frequency determining tuned circuit for producing oscillatory energy at the oscillating frequency,

a test coil at said location coupled to said tuned circuit for producing an inductive field at said oscillating frequency through which a plurality of said needles sequentially moves as they are projected at said location to enter, be exposed to and exit the field of said test coil during operation of said machine,

a second oscillating circuit nominally operating at substantially the same frequency as said first oscillating circuit, a coupling for bidirectional transfer of oscillatory energy between said first and second oscillating circuits, said coupling maintaining said oscillating circuits in frequency step,

means for setting a nominal phase relation between the oscillations of said first and second oscillating circuits when said plurality of needles of normal configuration are in said field of said test coil for producing a control signal having a first value which changes in response to changes in said nominal phase relation, and

means responsive to predetermined change in said control signal resulting from the phase change produced by one of said plurality of needles having an inductance altering abnormal configuration in said field of said test coil for stopping operation of said machine.

3,910,075

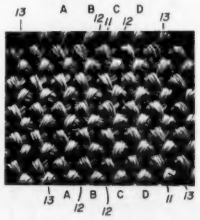
WARP KNIT ELASTIC FABRIC

Bettie E. Holliday, Pickens, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Sept. 3, 1974, Ser. No. 502,861

Int. Cl.[2] D04B *23/08*

U.S. Cl. 66—192 **19 Claims**



1. A warp knitted elastic fabric, comprising: a knitted ground construction comprising a pair of sets of relatively inelastic warp yarns formed into a plurality of wales and courses of single yarn stitch loops, one set of relatively inelastic warp yarns formed into single yarn stitch loops in alternate courses with each yarn of said one set formed into stitch loops in only one wale, and the other set of relatively inelastic warp yarns formed into single yarn stitch loops in the courses intervening between said alternate courses with each yarn of said other set formed into stitch loops alternately in two adjacent wales; and a set of relatively elastic threads laid-into the ground construction generally parallel to and between the wales with the yarns of said one set of relatively inelastic yarns extending about the laid-in relatively elastic yarns so that a relatively elastic yarn lies between the base portion of each of the stitch loops and the laps which are connected to each stitch loop of the yarns of said one set of relatively inelastic yarns, so that the inlaid relatively elastic yarns are substantially covered and maintained in the ground construction.

3,910,076

BASKET FILTER FOR AUTOMATIC WASHING MACHINES

Ernest Burlin Ruble, South Haven, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 26, 1973, Ser. No. 419,141

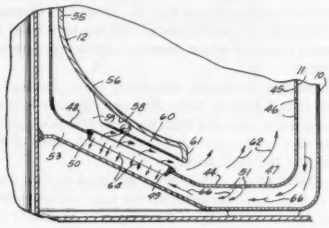
Int. Cl.[2] D06F *13/02, 39/10*

U.S. Cl. 68—18 F **13 Claims**

1. In a washing machine having a tub for containing washing fluid, a washing fluid filtering apparatus comprising:

a basket supported within the tub to form a chamber between the outside of said basket and the inside of said tub, said basket having a base portion and a wall portion, each portion having at least one opening which openings communicate the chamber with the interior of the basket;

means for creating a pulsating flow including a main flow and a partial counter flow of the fluid between the chamber and the basket through the opening in the base portion of said basket, said means for creating a pulsating flow causing a circulation of the fluid from said basket through the opening in the wall portion into and through the chamber; and



filter means disposed across each opening in the base portion of the basket for preventing the passage of particles contained in the washing fluid into the basket through the opening in the base portion of the basket whereby the partial counter flow through the filter means flushes particles from the filter means.

3,910,077

DEVICE FOR WET-PROCESSING LEATHER OR HIDES

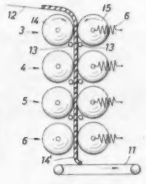
Hans Kessler, Aalen, Germany, assignor to Paul Ferentzi, Germany

Filed Oct. 15, 1973, Ser. No. 406,653

Claims priority, application Germany, May 25, 1973, 2327445

Int. Cl.² C14C *15/00*

U.S. Cl. 69—32 **3 Claims**



1. A device for wet-processing leather and hides, in which the materials to be treated are soaked in a treatment liquid and passed between pairs of pinch rollers loaded into contact with one another, said device comprising a plurality of individual pairs of pinch rollers arranged virtually in contact with one another and formed by two roller series which receive said material being treated directly thereinbetween; the rollers of one series being positionally fixed in bearings, said rollers of said one series being disposed in a side by side relationship such that said rollers almost touch each other in said side by side relationship, said rollers of said one series being rotatable about axes which are disposed in substantially the same plane; means for driving said one series of rollers, the other series of rollers being loaded into contact with the rollers of said first series of rollers, said other series of rollers being disposed in a side by side relationship such that said other series of rollers almost touch each other, said other series of rollers being rotatable about axes which are disposed in substantially the same plane, the load of each individual roller being separately adjustable;

said roller series being arranged vertically with the roller axes of the roller series being parallel to a single vertical plane and with the axes of each pair of rollers being disposed in the same horizontal plane;

said pairs of rollers having a downward feeding pinch; and

nozzles disposed between the rollers of each series and directed into the exit gaps of each roller pair for applying said treatment liquid to the material being treated.

3,910,078

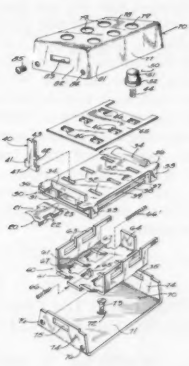
PUSH BUTTON LOCK

Donald A. Schulz, Milwaukee, Wis., assignor to S-B Manufacturing Co. Ltd., Milwaukee, Wis.

Filed Apr. 1, 1974, Ser. No. 456,582

Int. Cl.² E05B *37/16*

U.S. Cl. 70—30 **19 Claims**



1. A push button lock comprising a bolt having a series of recesses in a side of the bolt, a lock body having a channel for axial movement of the bolt, channels for tumblers in the lock body crossing the channel for the bolt, a tumbler movable axially in each said channel, each said tumbler having a rest position and an operated position, each tumbler being provided with a projection adapted to fit into a said recess in said bolt in an engaged position of said tumbler and adapted to be free of the recess of said bolt in another position of said tumbler, the engaged position of the projection being such as to prevent axial movement of the bolt, said engagement occurring in one of the rest position of the tumbler or the operated position of the tumbler, but not both, each side of each said tumbler being provided with a said projection, the projection on one side of each said tumbler being positioned so that its engaged position coincides with the rest position of the tumbler and the projection on the other side of the tumbler being positioned so that its engaged position coincides with the operated position of the tumbler, said tumblers being reversible in their channels to predetermine which projection is engageable with said bolt; a sliding cam plate underlying all of the tumbler channels, the sliding cam plate being movable between a first position and a second position, said cam plate being provided with a cam for each tumbler channel, each said cam underlying said channel in the second position and being spaced from the channel in the first position, each cam being shaped to force the tumbler in said tumbler channel to its rest position when the cam underlies the tumbler channel, whereby operation of the slidable cam plate forces all tumblers to their rest position, the slidable cam plate having an extension into the end of the bolt channel to move the cam plate from the first position to the second position by engagement with the end of the bolt as the bolt moves to the extreme end of the bolt channel, whereby insertion of the bolt to the

end of the bolt channel automatically resets all tumblers to their rest position and locks the bolt into the bolt channel.

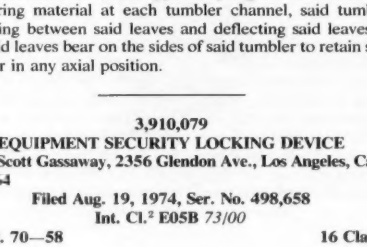
14. A push button lock comprising a bolt having a series of recesses in a side of the bolt, a lock body having a channel for axial movement of the bolt, channels for tumblers in the lock body crossing the channel for the bolt, a tumbler movable axially in each said channel, each said tumbler having a rest position and an operated position, each tumbler being provided with a projection adapted to fit into a said recess in said bolt in an engaged position of said tumbler and adapted to be free of the recess of said bolt in another position of said tumbler, the engaged position of the projection being such as to prevent axial movement of the bolt, said engagement occurring in one of the rest position of the tumbler or the operated position of the tumbler, but not both, each side of each said tumbler being provided with a said projection, the projection on one side of each said tumbler being positioned so that its engaged position coincides with the rest position of the tumbler and the projection on the other side of the tumbler being positioned so that its engaged position coincides with the operated position of the tumbler, said tumblers being reversible in their channels to predetermine which projection is engageable with said bolt, each tumbler being held in either the rest or the operated position by a friction member, the friction member comprising a flat plate of spring material over the tumbler channels, and opposed spring leaves struck from the spring material at each tumbler channel, said tumbler extending between said leaves and deflecting said leaves so that said leaves bear on the sides of said tumbler to retain said tumbler in any axial position.

3,910,079

EQUIPMENT SECURITY LOCKING DEVICE

James Scott Gassaway, 2356 Glendon Ave., Los Angeles, Calif. 90064

Filed Aug. 19, 1974, Ser. No. 498,658
Int. Cl.[2] E05B *73/00*
U.S. Cl. 70—58 **16 Claims**



1. A protective locking device for rendering inaccessible the head of a bolt having a head and a threaded shank which is adapted to protrude from the locking device through a mounting body and into an equipment to be protected, said locking device comprising:

a base member adapted to abut the body, said base member having a hole through which the shank of the bolt passes and protrudes and a seat at the hole preventing the bolt head from passing through the hole;

a protective member having an end member positioned to be juxtaposed to, and cover, a portion of the base member around the seat and having through said end member, a threaded hole which communicates with the bolt head; said protective member having a hollow shank with a peripheral wall which extends in a direction away from said seat;

said peripheral wall having spline means attached to its inner surface, extending in a direction away from said seat;

a lock body having a barrel adapted to fit into said shank and having a threaded neck which engages said threaded hole when the barrel is inserted into the shank;

said barrel containing transverse groove means and locking blade means movable transversely through said groove means;

means resiliently urging said blade means to protrude from a side of the barrel so as to normally engage said spline means;

said barrel having a key slot configured to permit entry of a key in the axial direction, to engage and urge said blade means to withdrawn from engagement with the spline means so that the barrel may be rotated to disengage its neck from the threaded hole so that the lock body may be removed from the shank, thereby permitting access to the bolt head;

and a shielding envelope extending from the end of the hollow shank remote from the base member to a periphery adapted to abut the base member at a position outside of said seat and to envelope the circumference of the lock barrel and the seat; and

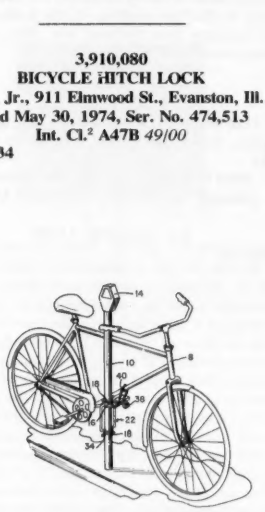
means attaching the envelope to the base so that the envelope cannot be removed from the base without withdrawing the blade means from the splines by means of the key, whereby when the shank of the bolt protruding from the base is covered by the body and equipment the locking device cannot be removed from the body and access to the bolt head is prevented while the locking blade means are in engagement with the spline means.

3,910,080

BICYCLE HITCH LOCK

Harold Dorsey, Jr., 911 Elmwood St., Evanston, Ill. 60202

Filed May 30, 1974, Ser. No. 474,513
Int. Cl.[2] A47B *49/00*
U.S. Cl. 70—234 **8 Claims**



1. A hitch for bicycles comprising a post;

means secured adjacent to the top of the post having a diametrical dimension greater than that of the post;

a pair of axially spaced collars of lesser diametrical dimension slipped on the post and rotatably encircling the post below said means, said means obstructing removal of said collars from the post;

an axially adjustable member secured to the post for supporting one of the collars at selected heights to set the limits of the vertical range of operational movement of said collars on the post; and

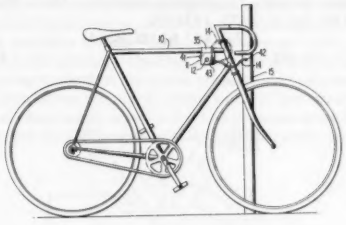
a formed element having a main portion bowed outward between two terminal portions and terminally secured to said collars to support the other collar in spaced relation from said one collar to form in combination with the post a closed loop that is pivotable about the post.

3,910,081

LOCKING MEANS FOR BICYCLES AND THE LIKE

David R. Pender, 1018 Marion St., Columbia, S.C. 29201

Filed May 7, 1974, Ser. No. 467,792
Int. Cl.² B62H *5/00*
U.S. Cl. 70—234 **10 Claims**



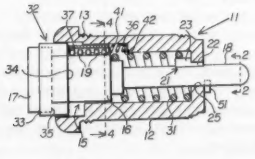
1. An anti-theft locking means for bicycles or other portable articles comprising a flexible tether attached to the bicycle and adapted to be extended therefrom, a plug-in latch means on the leading end of the tether adapted to be received by an aperture in a wall of an anchoring member to releasably secure the bicycle to such member, and a key activated means on the bicycle connected with said plug-in latch means of the tether and operable to deactivate the plug-in latch means whereby the same can be removed from said aperture, said tether comprising a hollow flexible tether, said plug-in latch means including spring urged latch elements which normally project radially of the tether to interlock with said aperture, and said key activated means including a flexible control element extending through the hollow flexible tether and being movable axially relative thereto and having a connection with said spring urged latch elements to retract such elements when said flexible control element is moved in one direction.

3,910,082

PLUNGER LOCK WITH COMPENSATING SPLINE

George P. Patriquin, Gardner, Mass., assignor to Hudson Lock, Inc., Hudson, Mass.

Filed Nov. 11, 1974, Ser. No. 522,645
Int. Cl.² E05B *29/02*
U.S. Cl. 70—360 **9 Claims**



1. A lock comprising:

a cylindrical housing for mounting on an enclosure to be locked, said cylindrical housing comprising an inner surface that defines an axial spline;

a plug means mounted for angular motion within said cylindrical housing between trapped and released positions and for axial motion therein between locked and unlocked positions only in said released position, said plug means defining a keyway for receiving a proper key;

a spline shell means disposed within said axial spline and axially movable therein; said spline shell means and said axial spline having engaging surfaces that prevent relative angular motion therebetween;

bias means for producing axial movement of said spline shell means withn said axial spline in response to axial movement of said plug means within said cylindrical housing; and

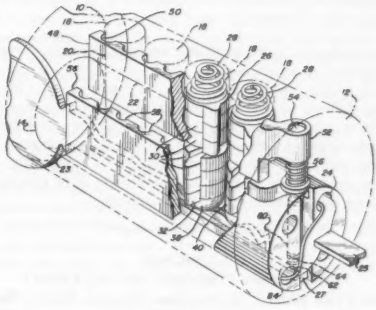
tumbler means mounted in said plug means and having portions normally biased into and engaging said spline shell means with said plug means in said trapped position so as to prevent angular motion thereof within said cylindrical housing, said tumbler portions being removable from said spline shell means to allow rotation of said plug means to said released position in response to insertion of a proper key into said keyway.

3,910,083

COMBINATION CHANGING CYLINDER LOCK

Glen E. Burlingame, 2858 W. 55th St., Chicago, Ill. 60632

Filed Mar. 1, 1974, Ser. No. 447,272
Int. Cl.² E05B *15/14, 25/00*
U.S. Cl. 70—383 **4 Claims**



1. A key operated tumbler lock including provisions for changing the configuration of the service key usable to operate the lock and comprising:

a lock body including a cylinder bore and a plurality of pin tumbler bores in communication with said cylinder bores; a lock cylinder disposed for rotational motion within said cylinder bore and including a plurality of pin tumbler bores corresponding to said lock body pin tumbler bores; a plurality of pin tumblers disposed in said lock body pin tumbler bores and said lock cylinder pin tumbler bores, at least one of said pin tumblers comprising a plurality of adjacent pin tumbler segments having adjacent surfaces with variable engagement characteristics dependent upon the relative orientation of said pin tumbler segments and changeable between at least a locking configuration and a passing configuration;

means for placing said pin tumbler segments in said passing configuration to enable changing the configuration of the service key; and

means for placing selected ones of said pin tumbler segments in said locking configuration to effect a change in the configuration of said service key.

3,910,084

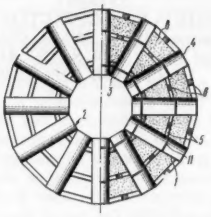
APPARATUS FOR EXPLOSIVE WORKING OF METALS

Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 9, kv. 21; Vladimir Mikhailovich Kudinov, ulitsa Filatova, 1/22, kv. 51; Jury Petrovich Bushtedt, bulvar Likhacheva, 3, kv. 73; Vladimir Georgievich Petushkov, ulitsa Pugacheva, 19a, kv. 6; Leonid Alexandrovich Volgin, ulitsa Erevanskaya, 14g. kv. 33; Georgy Ivanovich Pogoretsky, ulitsa Entuziastov, 35, kv. 151, and Leonid Leonidovich Sukhikh, ulitsa Dobrokhotova, 28, kv. 18, all of Kiev, U.S.S.R.

Filed Mar. 21, 1974, Ser. No. 453,366

Int. Cl.[2] B21D *26/02*

U.S. Cl. 72—56 10 Claims



1. An apparatus for explosive working of metals comprising a chamber in which articles to be worked an explosive disposed within said chamber can be disposed; said chamber being defined by end faces of a plurality of rectilinear pipes contacting each other edge-to-edge and arranged substantially at right angles to an imaginary surface of the chamber, and means sealing off spaces between said end faces of the pipes, the length of each pipe being equal to at least one-half the smallest linear dimension of the chamber.

3,910,085

VIBRATORY FORMING OF MATERIALS

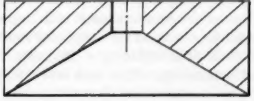
David Colin Biddell, Birmingham; Graham Robert Dawson, Bewdley, and Dennis Hugh Sansome, Sutton Coldfield, all of England, assignors to National Research Development Corporation, London, England

Filed Mar. 25, 1974, Ser. No. 454,758

Claims priority, application United Kingdom, Mar. 26, 1973, 14519/73

Int. Cl.[2] B21C *3/04*

U.S. Cl. 72—56 7 Claims



1. A vibrator unit for use in the vibratory forming of materials comprising:

a member of generally annular shape disposed around a central axis and having an inner peripheral surface and an outer peripheral surface axially deeper than said inner peripheral surface, and at least parts of said inner peripheral surface lying in the same transverse planes, relative to said central axis, as parts of said outer peripheral surface; and

means to receive vibrators formed in said outer peripheral surface.

3,910,086

METHOD AND MEANS FOR SHAPING PARTS BY HYDRAULIC EXTRUSION

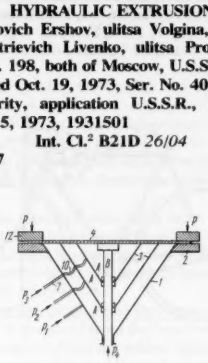
Vladislav Ivanovich Ershov, ulitsa Volgina, 19, kv. 16, and Nikolai Dmitrievich Livenko, ulitsa Profsojuznaya, 100, korpus 4, kv. 198, both of Moscow, U.S.S.R.

Filed Oct. 19, 1973, Ser. No. 408,004

Claims priority, application U.S.S.R., Mar. 30, 1973, 1902339; July 5, 1973, 1931501

Int. Cl.[2] B21D *26/04*

U.S. Cl. 72—57 8 Claims



1. A device for hydraulically extruding a part out of a sheet metal workpiece comprising, a vessel on which said workpiece is mounted; a pressurized liquid supply communicating with said vessel; clamping means for fastening said workpiece onto said vessel about the periphery thereof; a guide member installed with one end thereof in the head of said vessel; a plurality of auxiliary vessels sequentially mounted on said guide member so as to reciprocate freely therealong and adapted to fit one into another; said auxiliary vessels having edges pressed against said workpiece to define between same and said adjacent vessels hermetically sealed cavities; said cavities being defined by said auxiliary vessels and said workpiece, each said cavity being hydraulically connected to said pressurized liquid supply, the areas of the outer and inner surfaces of each one of said auxiliary vessels being determined by the difference in loads exerted thereupon by the pressure of the liquid in said cavities adjoining said vessel on both sides, so that the load inside said vessel is substantially smaller than that outside said vessel.

3,910,087

HYDRAULIC-FORMING MACHINE

Everett E. Jones, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 18, 1974, Ser. No. 533,992

Int. Cl.[2] B21D *22/10, 28/18*

U.S. Cl. 72—63 26 Claims

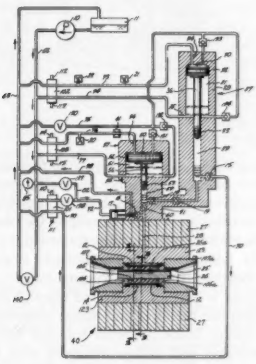
1. An apparatus for compressively conforming a metal part to the contour of a die, a pressure vessel defining a pressure chamber, a pressure-deformable mandrel enclosed within the chamber, the part and the die being positionable inside the mandrel, supply means for supplying pressure fluid, means for selectively connecting the supply means with the pressure vessel pressure chamber to prepressurize the pressure vessel pressure chamber;

low pressure amplifier means having an input chamber selectively connectable with the supply means and an output chamber in communication with the pressure vessel pressure chamber, the low pressure amplifier means being operable when the input chamber is pressurized with pressure fluid from the supply means to increase the pressure in the pressure vessel pressure chamber for exerting compressive forming effort through the mandrel upon the part, the low pressure amplifier means being operable to increase the fluid pressure in the pressure vessel pressure chamber up to a first maximum fluid pressure;

high pressure amplifier means having a second input chamber selectively connectable with the supply means and a second output chamber in communication with the pres-

sure vessel pressure chamber, the high pressure amplifier means being operable when the second input chamber is pressurized with pressure fluid from the supply means to increase the fluid pressure in the pressure vessel pressure chamber for exerting compressive effort through the mandrel upon the part;

control valve actuator means responsive to the transition pressure means for connecting the supply means with the first-mentioned input chamber to operate the low pressure amplifier to increase the fluid pressure in the pressure vessel pressure chamber for selected forming pressures up to the first maximum pressure, and alternatively for connecting the supply means with the first-mentioned input chamber to operate the low pressure amplifier to increase the fluid pressure in the pressure vessel pressure



chamber up to the first maximum pressure, and then for connecting the supply means with the second input chamber to operate the high pressure amplifier to further increase the fluid pressure in the pressure vessel pressure chamber for selected forming pressures greater than the first maximum pressure;

the control valve means also being responsive to the pressure selector means for depressurizing the first-mentioned input chamber, and alternatively the first-mentioned and second input chambers when the fluid pressure in the pressure vessel pressure chamber reaches the selected forming pressure; and,

depressurization means responsive to the pressure selector means for depressurizing the pressure vessel pressure chamber upon depressurization of the first-mentioned input chamber and alternatively with depressurization of the first-mentioned and second input chambers.

25. A method for compressively conforming a portion of a metal blank to the contour of a die using pressurized pressure fluid surrounding a pressure deformable mandrel for transmitting compressive forming effort to the metal blank, first and second reciprocative pistons each movable in one direction to incrementally increase the pressure of the pressure fluid and alternately movable in a reverse direction without increasing the pressure of the pressure fluid, comprising the steps of:

moving the first piston in one direction to incrementally increase the pressure of the pressure fluid and alternately moving the first piston in a reverse direction, and wherein the first piston is moved in the one direction and then in the reverse direction in alternate sequence until the pressure of the pressure fluid is incrementally increased to a desired forming pressure less than a transition pressure; alternatively moving the first piston in the one direction and then in the reverse direction in alternate sequence until the pressure of the pressure fluid reaches the transition pressure; and

moving the second piston in the one direction so as to further incrementally increase the pressure of the pressure fluid to a second desired forming pressure greater than the transition pressure while simultaneously therewith holding the first piston stationary.

3,910,088

MACHINE FOR STRAIGHTENING OF ROUND BARS OR TUBES

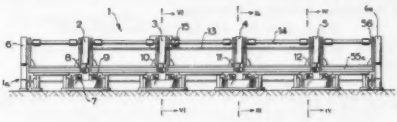
Horst Lorenz, Solingen, and Gunter Gerhardt, Wuppertal-Vohwinkel, both of Germany, assignors to TH. Kieserling & Albrecht, Solingen, Germany

Filed Oct. 17, 1974, Ser. No. 515,712

Claims priority, application Germany, Oct. 18, 1973, 2352281

Int. Cl.² B21D *3/04*

U.S. Cl. 72—98 **16 Claims**



1. In a straightening machine for elongated tubular or rod-shaped workpieces, a combination comprising an elongated frame; a row of straightening units mounted in said frame, each of said units including a group of straightening rolls, at least one roll of each of said groups being movable between an extended position of engagement with a workpiece and a retracted position in which a workpiece is insertable into and removable from said units; and means for moving said movable roll between said positions thereof, including a single shaft rotably mounted in and extending lengthwise of said frame, and having a plurality of eccentric portions, one for each unit, connecting rod means between each of said eccentric portions and the movable roll of the respective unit, and drive means for rotating said single shaft through an angle so that said eccentric portions are in one of the dead center positions when said movable rolls are in their extended positions.

3,910,089

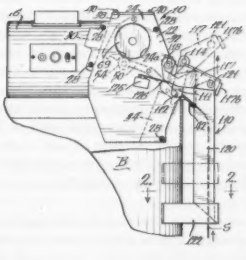
STRAP COIL AND METHOD AND APPARATUS FOR FORMING SAME

William A. Meier, Hoffman Estates, and Robert J. Massion, Cary, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed May 22, 1974, Ser. No. 472,177

Int. Cl.² B21C *47/06*

U.S. Cl. 72—146 **7 Claims**



1. Apparatus for forming a length of metallic strap which comprises frame means, means defining a feed path for said strap including an elongate lever member pivotally attached to

said frame means at its mid portion, the upper surface of said lever member defining a portion of said feed path; curler means positioned adjacent the downstream end of said path, said curler means defining a radius working surface extending across said path, roller means rotatably mounted at the downstream end of said lever member, means resiliently biasing said lever member to an operative position so that said roller means is positioned adjacent said curler means and is adapted to cooperate with said curler means to define a zone therebetween for bending said strap beyond its yield point, and means for feeding said strapping longitudinally along said path and through said bending zone, whereby said strap is formed into a coil.

3,910,090

TWO-HIGH ROLL STAND WITH ROLL ADJUSTING AND OVERLOAD PREVENTION MECHANISM

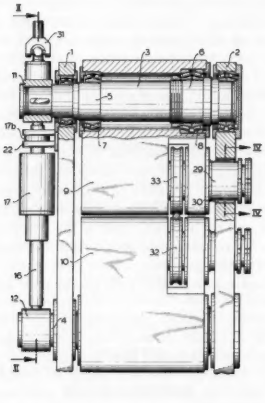
Horst Lorenz, Solingen, Germany, assignor to TH. Kieserling & Albrecht, Solingen, Germany

Filed May 15, 1974, Ser. No. 469,970

Claims priority, application Germany, May 23, 1973, 2326140

Int. Cl.[2] B21B *31/26, 31/24*

U.S. Cl. 72—245 **7 Claims**



1. In a metal working machine having a two-high roll stand including a mechanism for radially adjusting and for preventing an overload of the rolls, comprising:

horizontally spaced roll stand frames;

two vertically spaced shafts interposed between and linking said frames;

eccentric journal means formed on each said shafts;

a roll housing eccentrically mounted about each shaft;

a radial roll adjustment linkage system having a lever secured at one common end to each of said shafts, each lever being constructed and arranged to establish a longitudinal axis whose location coincides with the main axis of the corresponding eccentric journal means, said axes defining a substantially right angle with an imaginary line defined by the axis of rotation of said shaft; linkage shaft means articulately connecting to each said lever for moving each lever to alter the radial distance between the roll housings;

hydraulic piston drive means including a piston formed on said linkage shaft means and responsive to predetermined roll overload conditions to act upon part of said linkage system;

and rotary drive means connecting to said lever and linkage system for controlling the rotary movement of said linkage system.

3,910,091

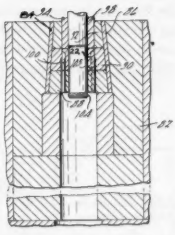
APPARATUS AND METHOD FOR COLD EXTRUSION OF GEARS

Shyam K. Samanta, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 465,634, April 30, 1974, abandoned. This application Aug. 8, 1974, Ser. No. 495,708

Int. Cl.[2] B21C *23/00*

U.S. Cl. 72—256 **15 Claims**



10. A gear extrusion process comprising the steps of inserting a first hollow blank within a die having internal teeth, the blank having received therethrough a mandrel with a precise diametrical fit within the central opening in the blank, a sleeve surrounding the mandrel and forming therewith a mandrel and sleeve assembly, advancing the mandrel and sleeve assembly and applying thereby an axial extruding force on the blank whereby the blank is partially extruded through the die tooth spaces, retracting the mandrel and sleeve assembly and placing a second hollow blank adjacent the first blank, and advancing the mandrel and sleeve assembly into engagement with the second blank whereby final extrusion of the first blank occurs as the second blank is partially extruded, said mandrel having a straight shaft portion and a circular land portion of larger diameter than the shaft portion, including the step of withdrawing said mandrel following extrusion whereby the land portion precisely sizes the inside diameter of the finished extruded part.

12. An extrusion die assembly comprising a circular extrusion die with internal teeth, a die holder supporting said die, a mandrel with a circular shaft portion of predetermined diameter, and a central opening in said holder receiving said die, said mandrel extending through said central opening and adapted to be received through a hollow gear blank, a sleeve punch surrounding said mandrel and forming therewith a mandrel and sleeve assembly, said sleeve being adapted to engage one axial side of said blank as said mandrel and sleeve assembly is advanced thereby extruding said blank through said die, the shaft portion of said mandrel providing radial support for the material of said blank thereby controlling the blank material displacement during extrusion which results in full, precise tooth development during extrusion, said die assembly including a die stress ring in said holder surrounding said circular die, said stress ring providing radial support for said die.

3,910,092

METAL EXPANDING MACHINE

Harold Rex Jury, Norwood, and Ronald McKenzie Howells, Yennora, both of Australia, assignors to Comalco (J. & S.) Pty. Limited, Australia

Filed Aug. 13, 1973, Ser. No. 387,703

Claims priority, application Australia, Aug. 24, 1972, 197/72

Int. Cl.[2] B21D *31/04*

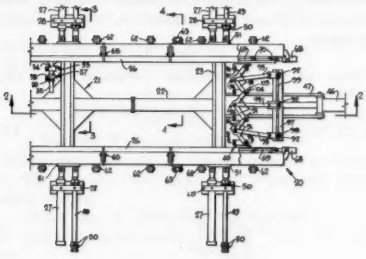
U.S. Cl. 72—302 **15 Claims**

1. A metal expanding machine for the expanding of a workpiece having spaced parallel edge portions, comprising:

a frame having a longitudinal member and bearers extending transversely thereof,

a pair of spaced parallel workpiece tool supports supported by the bearers and extending in a longitudinal direction, workpiece engaging tools carried by respective said tool supports and arranged to engage the longitudinal edge portions of a workpiece having a web between the edge portions and a series of rows of slots in the web, the slots of each row being staggered with respect to and overlapping the slots of at least one adjacent row,

power actuated means operatively coupling the tool supports and arranged upon actuation to increase the transverse distance between the tool supports thereby expanding a workpiece when its longitudinal edge portions are engaged by the tools, comprising



a first abutment member and a first control member operatively coupled to said power actuated means, one of the members being secured to the frame and the other secured to the tool support and respectively positioned so that at the end of said movement which increases the transverse distance between the tool supports said power actuating means is reversed to reduce said transverse distance, and

a second abutment member co-operable with a second control member respectively positioned so that after sufficient said reverse movement to relax tension in said expanded workpiece said reverse movement is terminated.

3,910,093

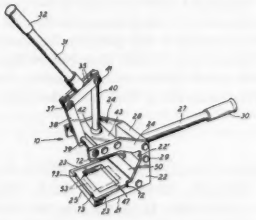
CONNECTION OF DOWNSPOUTS TO RAIN GUTTERS

John E. Maloney, Jr., Addison, and Richard F. Zaccagni, Lombard, both of Ill., assignors to ZMC, Inc., Addison, Ill.

Filed Mar. 15, 1973, Ser. No. 341,519

Int. Cl.² B21D *31/02*

U.S. Cl. 72—325 **9 Claims**



1. In a device for preparing a rain gutter for connection of a downspout thereto:

a female die having a die aperture dimensioned for the desired size of downspout opening to be formed in a gutter bottom wall, and the female die being engageable with the underside of the gutter bottom wall;

a male die member having cutter means and being movable in alignment with said female die toward the upper side of the gutter bottom wall;

means for driving the male die member toward the female die to force the cutter means to engage the area of the gutter bottom wall conforming to the area of the aperture in said female die to effect cutting of the gutter bottom wall material in said gutter bottom wall area into tab means; and

said male die member comprising a die block complementary to, and of sufficient differential undersize relative to said die aperture to permit operating projection of the die block into the aperture for displacing material of the gutter bottom wall about the perimeter of said gutter bottom wall area into the die aperture and form a continuous downward lip flange entirely around the edge of the opening in said bottom wall and from which the tab means extend integrally to be received together with said lip flange in the upper end of a downspout placed in alignment with the opening.

3,910,094

METHOD AND APPARATUS FOR FORMING INTEGRAL COUPLING FLANGES IN HOLLOW METALLIC ARTICLES

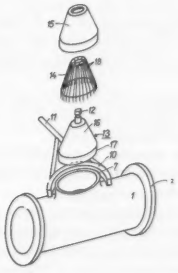
Hans Lüttgert; Karl Brunk; Johannes Dietrich, and Emanuel Pahl, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 5, 1974, Ser. No. 458,409

Claims priority, application Germany, Apr. 6, 1973, 2318064; Apr. 6, 1973, 2318060

Int. Cl.² B21D *51/40*

U.S. Cl. 72—342 **16 Claims**



1. In a method of forming an integral coupling flange in a hollow metallic article, said article, including a surface opening therein about which said flange is formed, in which said article is heated in the region of said opening to a temperature suitable for the shaping of the metal thereof, and said flange is formed by moving an extruding tool through said opening from the interior of said article the improvement comprising the steps of:

continuously heating the metallic article in the region of said opening at said temperature suitable for shaping of the metal thereof throughout the shaping of the metal and formation of the flange, and

shaping said metal to form said flange by moving an extruding tool having a low thermal conduction characteristic through said opening whereby the flow of heat drawn from said metal by said tool is minimized thereby facilitating maintaining said temperature in said metal as the same is shaped.

3,910,095

MECHANISM FOR STRIPPING A DRAWN CONTAINER FROM THE PUNCH OF A DEFORMING TOOL

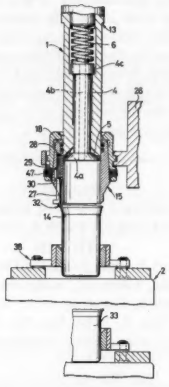
Wilhelm Hortig, Auerbach, Germany, assignor to KM-Engineering AG, Basel, Switzerland

Filed May 15, 1974, Ser. No. 470,260

Claims priority, application Switzerland, May 25, 1973, 7570/73

Int. Cl.[2] B21D *45/08*

U.S. Cl. 72—344 **18 Claims**



1. In a mechanism for forming and stripping a container having a mouth wherein the container is formed on a punch during the inserting portion of a deformation stroke through a deforming die and stripped from the punch during the withdrawing portion of the deformation stroke, the combination comprising:

a. an annular stripper member located ahead of the deforming die and disposed around and in a zone of movement during the deformation stroke,

b. said stripper member being effective to strip the container from the punch during said withdrawing portion of the deformation stroke, and

c. beveled means adapted to act upon the peripheral edge of the mouth against a peripheral edge section of the deforming die to form a conically shaped widened portion along said peripheral edge of the mouth,

d. said beveled means being effective to form said conically shaped widened portion toward the end of the inserting portion of the deformation stroke,

e. said stripper member including a stripper surface disposed obliquely with respect to the axis of the punch,

f. said stripper surface being effective to abut said widened portion on the withdrawing portion of the stroke causing the container to be removed from the punch.

5. A mechanism for forming and stripping a container having a mouth, comprising:

a. a deforming die and a punch means which cooperates with a die for forming a container,

b. said punch means being movable through a deformation stroke having an inserting portion and a withdrawing portion,

c. a movably mounted stripper means located ahead of the deforming die and being effective to strip the container from the punch during the withdrawing portion of the deformation stroke, and

d. said stripper means including a stripper member and a means for holding the stripper member stationary at a location laterally displaced ahead of the deforming die,

e. beveled means located on the stripper member for abutting the peripheral edge of the container mouth against a peripheral edge section of the deforming die,

f. said beveled means being effective to form a conically shaped widened portion along said peripheral edge of the mouth toward the end of the inserting portion of the deformation stroke,

g. said beveled means further being effective to abut said conically shaped widened portion during the withdrawing portion of the deformation stroke causing the container to be removed from the punch while the stripper member is stationary.

3,910,096

COINING PRESS

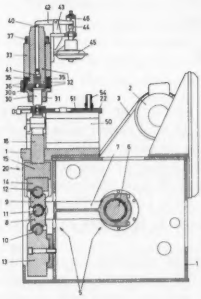
Alfred Debus, Dietzholztal-Ewersbach, Germany, assignor to Theodor Gräbener Maschinenfabrik, Netphen Werthenbach, Germany

Filed Sept. 17, 1974, Ser. No. 506,849

Claims priority, application Germany, Sept. 18, 1973, 2346810

Int. Cl.[2] B21D *22/00, 45/00*

U.S. Cl. 72—344 **11 Claims**



1. A coining press having a coining drive comprising a power-transmitting element, means for feeding coin blanks via a table to a ring collar, a driven male die and an ejector die which are opposed and adapted to be pressed together by means of the coining drive with the interposition in each coining operation of a coin blank retained by the ring collar, and having an ejector and an ejector drive means for removing the coined coin blanks characterized in that the coining drive is disposed in the bottom part of the press and each stroke at the coining drive is made upwardly, whereas the ejector drive means is disposed in the top part of the press and the stroke of the ejector drive is made downwardly; and the power-transmitting element has a top portion the downwardly directed stroke of which is so limited that, before the coin blank feeding and coin blank ejector means operate, the coining surface of the driven male die is flush with the table.

3,910,097

PRESSING TOOL FOR PREPARING WORK PIECES

Miroslav Kubálek, Deublergasse 42/2, Vienna 21, Austria

Filed Mar. 11, 1974, Ser. No. 449,978

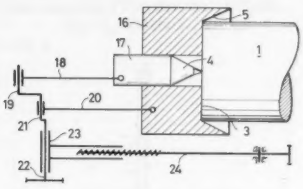
Claims priority, application Austria, Mar. 15, 1973, 2304/73

Int. Cl.[2] B21D *28/32*

U.S. Cl. 72—354 **3 Claims**

1. A pressing tool for preparing work pieces of a tough material on at least one front side for point centering, said tool comprising an outer part presenting a pressing surface and an

inner part carrying a countersink pin (4) to press a centering bore into the work piece, said countersink pin presenting a

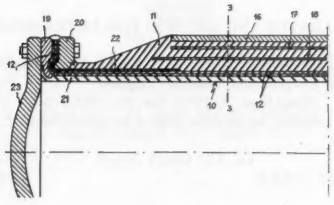


conical point whose tip portion has a steeper cone angle than its base portion to provide point clearance.

3,910,098
MANDREL FOR SHAPING PIPES

Franck Tailhardat, Chamalieres, France, assignor to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, France

Filed Oct. 17, 1974, Ser. No. 515,525
Claims priority, application France, Oct. 17, 1973, 73.37152
Int. Cl.² B21D *9/01*
U.S. Cl. 72—466 **6 Claims**



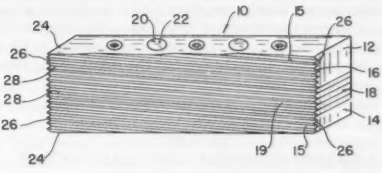
1. An expansible mandrel for curving into the desired shape large-diameter metal pipes which are used, for example, to convey petroleum products comprising a central expansible tube having a rubber wall braced with at least one pair of layers comprising metal cables crossed from one layer to the other and inclined at an angle of about 10° to 45° with the longitudinal axis of the tube and a thick cylindrical rubber sleeve externally covered with flexible longitudinal extending plates adhering to the rubber of the sleeve arranged around said tube, said sleeve also comprises at least one pair of reinforcing layers comprising metal cables oriented in cross directions and forming a slightly smaller angle than the angle of the cable in the inner bracing layers of the expansible tube.

3,910,099
DIE MEMBER

Charles A. Wilson, Williamstown, N.J., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed Dec. 26, 1973, Ser. No. 428,113
Int. Cl.² B21D *17/00*
U.S. Cl. 72—469 **12 Claims**

1. A die for rolling threads on a fastener blank including a plurality of individual rib members each separable from the other secured together in abutting relationship, each individual rib member having a single edge only, said edge having a

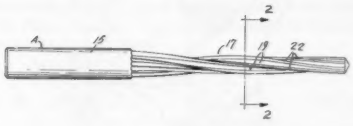


working configuration thereupon for forming a thread on a fastener.

3,910,100
DEFORMING TOOL FOR DIE MAKING

Isin Ivanier, 5509 Westbourne, Montreal, Quebec, Canada

Division of Ser. No. 808,594, March 19, 1969, Pat. No. 3,764,278. This application Oct. 3, 1973, Ser. No. 403,335
Int. Cl.² B21K *5/20*
U.S. Cl. 72—479 **4 Claims**

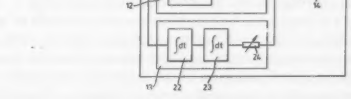


1. A deforming tool for making a wire-drawing die, comprising, an elongated tool body extending along a longitudinal axis and having a core of circular cross-section tapering throughout its working length, a plurality of equally spaced apart deforming ribs projecting from and extending spirally about said circular cross-sectioned core with portions between adjacent ribs being formed by a convex surface of the core, each cross-section of each rib lying in a plane perpendicular to the longitudinal axis of the tool forming an isosceles triangular configuration in which the flanks of said triangular configuration are symmetrical about an extended radius perpendicular to said longitudinal axis.

3,910,101
DEVICES FOR MEASURING DENSITY

Otto Kratky, Waltendorfer Haupstrasse 76e; Hans Leopold, and Hans Stabinger, both of August-Musger-Gasse 4, all of A-8010 Graz, Austria

Filed May 29, 1973, Ser. No. 364,652
Claims priority, application Austria, Oct. 25, 1972, 9132/72
Int. Cl.² G01N *9/00*
U.S. Cl. 73—32 A **13 Claims**



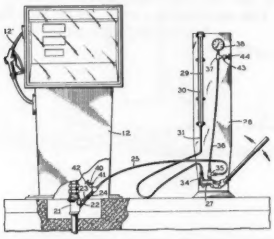
1. A device for measuring the density of a fluid by determining the resonant frequency of a mechanical oscillator which in

use contains in its oscillatory mass a measuring sample of fluid, wherein a mechanical to electrical transducer influenced by the oscillatory mass is connected to an electrical to mechanical transducer acting on the oscillatory mass via an electronic circuit which comprises means to alter to a predetermined degree the phase and amplitude of the signal exciting the oscillatory mass for the purpose of compensating for predetermined temperature-change and the effect of the mass of the suspension.

3,910,102
LIQUID VOLUMETRIC LINE LEAK TESTING APPARATUS AND METHOD

F. Ronald McLean, Apt. 1600, 333 N. Ocean Blvd., Deerfield Beach, Fla. 33441

Filed May 17, 1974, Ser. No. 470,852
Int. Cl.² G01M *3/26*
U.S. Cl. 73—40.5 R **23 Claims**



1. Apparatus for detecting a leak in a gasoline line extending from an above-ground gasoline dispensing apparatus down to an underground gasoline storage tank provided with a check valve for preventing return flow of gasoline back down into the tank, said apparatus comprising:

a pump selectively operable to pump gasoline into said line;

means for detachably connecting the outlet of said pump to said line at said dispensing apparatus for pumping gasoline into said line;

pressure sensing means operatively connected to said line to sense the gasoline pressure established in said line by said pump;

and volumetric measuring means operatively connected to said pump to supply makeup gasoline to said pump and thereby sense any loss of gasoline after pressurization of said line by said pump.

3,910,103
MEDICAL APPARATUS FOR MEASURING BLOOD SEDIMENTATION

Ewald Rose, August-Antz-Str. 25, 55 Trier-Ehrang, Germany

Filed May 20, 1974, Ser. No. 471,563
Claims priority, application Germany, May 23, 1973, 2326136
Int. Cl.² G01N *15/04, 33/16*
U.S. Cl. 73—61.4 **3 Claims**

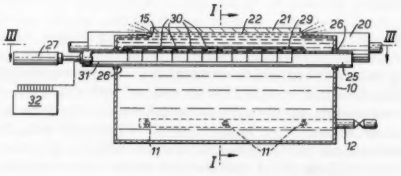
1. Medical apparatus for receiving fluid from a fluid supply and measuring blood sedimentation comprising a pipette having a transparent wall portion carrying a scale of graduations thereon, the opening through one end of said pipette forming an inlet aperture and the opening through the opposite pipette end forming an outlet aperture, an annular flange projecting radially outwardly from said pipette adjacent to the outlet aperture, and a container having a closed end and an open end, said container receiving the pipette outlet aperture end and having a cross-sectional shape complemental to and fluidtightly fitting around the periphery of said pipette annular flange, said container including inwardly projecting stop

means adjacent to its open end for limiting movement of said pipette annular flange toward said container open end.

3,910,104
APPARATUS AND METHOD FOR ULTRASONIC TESTING

David Harris Davies, Guisborough, England, assignor to British Steel Corporation, London, England

Filed Sept. 4, 1974, Ser. No. 502,916
Claims priority, application United Kingdom, Sept. 7, 1973, 42441/73
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.8 S **11 Claims**

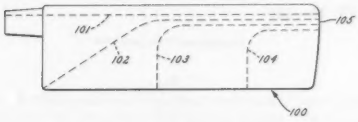


1. Apparatus for ultrasonically testing a test piece utilising water as a coupling medium between ultrasonic transducers and a test piece moving relative to the testing apparatus along a predetermined pathway, which apparatus comprises guide means defining the pathway to be followed by the test piece, a reservoir for the water so arranged in relation to the pathway that the water can contact successive parts of the test piece to be tested, a beam in the reservoir mounted for axial reciprocation transversely of the pathway, and a plurality of ultrasonic transducers carried spaced along the beam operatively directed towards the pathway, the beam and the ultrasonic transducers carried thereon having in combination substantially neutral or positive buoyancy in water.

3,910,105
METHOD FOR DETECTION OF FLAWS IN COMPOSITE FIBERGLASS STRUCTURES

Donald J. Hoffstedt, Drexel Hill, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 16, 1974, Ser. No. 497,996
Int. Cl.² G01N *21/00*
U.S. Cl. 73—88 A **3 Claims**

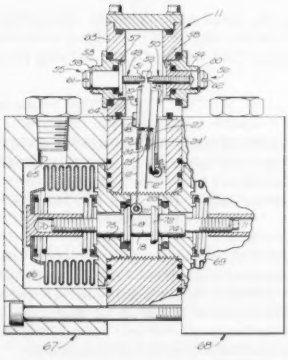


1. A method of detecting structural flaws in a composite filamentary reinforced plastic structure comprising the steps of:
   a. Placing optical filaments, within the filamentary reinforced structure in such a manner that the ends of the optical fibers are accessible as inspection points and light source points;
   b. Subjecting the structure to loads;
   c. Removing the loads;
   d. Applying a light source to the light source end of the optical fibers;
   e. Monitoring the light output at the inspection end of the optical fibers being illuminated;
   f. Identifying discontinuities of the optical filament, by noting which filaments do not conduct light from the light source point to the inspection point.

3,910,106
TRANSDUCER

Edward R. Brady, Sierra Madre, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 27, 1974, Ser. No. 527,659
Int. Cl.² G01L *1/22*; **G01B** *7/18*
U.S. Cl. 73—88.5 R **6 Claims**

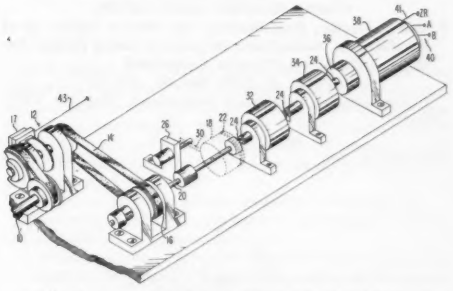


1. A static pressure compensated transducer comprising: a base; first and second cantilever leaf spring beams each having one end fixed relative to said base; means to move the other end of said first beam in a direction approximately normal to the plane thereof, the other end of said second beam being suspended freely from said base in a stationary position independent of the position and movement of the other end of said first beam; a Wheatstone bridge having first, second, third and fourth legs and first, second, third and fourth conductive corners, said first, second, third and fourth legs being connected between said first and second, second and third, third and fourth, and fourth and first conductive corners respectively, said corners acting as junctions; first and second strain gages fixed to opposite sides of said first beam between the ends thereof and connected in series in said first and second bridge legs, respectively; third and fourth strain gages fixed to opposite sides of said second beam between the ends thereof and connected in series in said third and fourth bridge legs, respectively; means to supply different potentials to said first and third bridge corners; and output means connected from and responsive to a difference of potential between said second and fourth corners to produce an output signal which is a function of the magnitude of the movement of the said other end of said first beam, said base defining a chamber having a fluid therein, both of said beams being fixed to said base in positions extending into the self-same said chamber and being subjected to the fluid pressure in said chamber, said function being less sensitive to changes in said fluid pressure than it would be were said second beam and said third and fourth strain gages isolated from said chamber.

3,910,107
APPARATUS FOR RUNNING-IN AND AUTOMATICALLY TESTING ELECTRICALLY ACTUATED CLUTCHES

Donald F. Fabry, Garden City, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 1, 1974, Ser. No. 456,527
Int. Cl.² G01M *13/02*
U.S. Cl. 73—118 **11 Claims**



1. In an improved clutch test apparatus having drive means for rotating the drive portion of a clutch, a load connectible to the load portion of the clutch, and a clutch voltage controller for actuating the clutch during run-in and testing, the improvement comprising:
   pulse generating means for generating a plurality of pulses;
   run-in counter means responsive to said pulse generator means for timing the run-in of the clutch; and
   cooling counter means responsive to said pulse generator means for timing the cooling of the clutch.

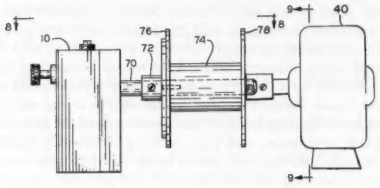
3,910,108
TENSIONING DEVICE

Russell J. Ries, 1611 Garden Club Drive, Fort Wayne, Ind. 46825

Continuation-in-part of Ser. No. 244,462, April 17, 1972, abandoned. This application June 27, 1973, Ser. No. 374,052
Int. Cl.² G01L *3/20*
U.S. Cl. 73—143 **1 Claim**

1. An improved hydraulic device for use in combination with a prime mover comprising a pair of gear wheels constructed and proportioned to fit in close fitting relationship therebetween, enclosure means forming a chamber having input and output portions for receiving said gears and providing bearing surfaces one on each side of each gear whereby fluid from each such gear is transferred through said enclo-

sure, passage means formed in said enclosure and interconnecting said input and output portions of said chamber, adjustable valve metering means disposed within said passage means to controllably restrict the flow of fluid and thereby effect a regulatable load acting as a resistance force to the rotation of



said gears, calibrated measuring means responsive to fluid pressure within said chamber, a spool operatively secured to said hydraulic device and adapted to receive wire, rope, cable and the like, and means forming a coupling between said spool, said prime mover and said hydraulic device.

3,910,109

APPARATUS FOR TESTING MECHANICALLY LOADED WHEEL-SHAPED COMPONENTS

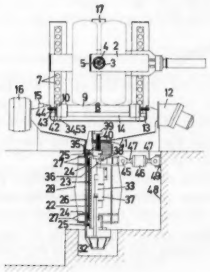
Rudolf Pavlovsky; Fritz Mahnig, and Werner Tobler, all of Schaffhausen, Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Mar. 25, 1974, Ser. No. 454,277

Claims priority, application Switzerland, Mar. 29, 1973, 4528/73

Int. Cl.[2] G01M *17/00*

U.S. Cl. 73—146 **15 Claims**



1. An apparatus for testing mechanically loaded wheel-shaped components, comprising:

a shaft for supporting a wheel-shaped component to be tested;

a plurality of parallel drive rollers for engaging the wheel-shaped component;

a common roller table for supporting said drive rollers;

drive means for imparting rotation to the wheel-shaped component; and

means for pivoting said drive rollers with respect to axis of rotation of the wheel-shaped component to vary the mutual angular position between said drive rollers and the axis of rotation.

3,910,110

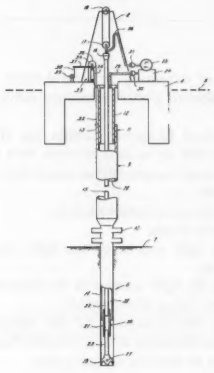
MOTION COMPENSATED BLOWOUT AND LOSS CIRCULATION DETECTION

Robert Kennedy Jefferies, Reston, Va.; Glenn D. Wickline, deceased, late of Houston, Tex., by Barbara Alice Wickline, executrix, Houston, Tex., and Kian Mohammed Mirdadian, Houston, Tex., assignors to The Offshore Company, Houston, Tex.

Continuation of Ser. No. 403,380, Oct. 4, 1973, abandoned. This application Sept. 26, 1974, Ser. No. 508,883

Int. Cl.[2] E21B *47/10*

U.S. Cl. 73—155 **12 Claims**



1. A method of detecting the commencement of blowouts or lost circulation in a subaqueous wellhole connected through risers or the like with a floating vessel and in which drilling fluid is being pumped from a mud system aboard the vessel into the wellhole and circulated back to the mud system, including the steps of:

detecting the rate of flow of the drilling fluid back to the mud system and generating a signal proportional thereto; and

modifying the signal to compensate substantially instantaneously for the change in the volume of the flow path of the drilling fluid caused by the heaving motion of the vessel.

3,910,111

WAVE HEIGHT MEASURING DEVICE

George E. Mott, and Robert L. Skaggs, both of Metairie, La., assignors to Texaco Inc., New York, N.Y.

Filed May 1, 1972, Ser. No. 248,995

Int. Cl.[2] G01B *17/00*

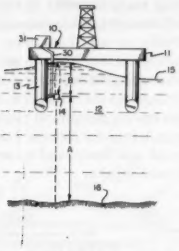
U.S. Cl. 73—170 A **8 Claims**

1. The combination with a marine structure adapted to be floatably positioned in an offshore body of water in which high waves and turbulent water conditions are prevalent, and which marine structure is free to be displaced vertically in response to the forces of wind and water acting thereagainst, of a wave height measuring device comprising;

first measuring means depending from said structure, being disposed beneath the surface of said body of water and being actuatable to generate a first signal for gauging the vertical distance between said first measuring means and the floor of said body of water,

second measuring means depending from said structure and disposed beneath the water's surface, said second measuring means being actuatable to generate a second signal to gauge the vertical distance between said second mea-

suring means and said water's surface, and

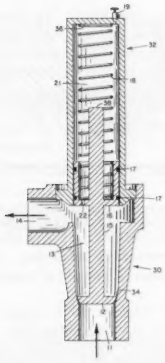


means for integrating said respective first and second signals whereby to determine the varying height of said water's surface with respect to said vessel.

3,910,112
FLOW METER

C. Richard Gerlach, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed May 17, 1974, Ser. No. 470,813
Int. Cl.[2] G01F *1/00*
U.S. Cl. 73—210 **11 Claims**

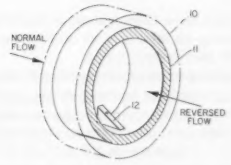


1. A flow meter comprising;
a housing having an inlet and outlet means;
a contoured cylinder in said housing with said contour being progressively outward from a small end to a large end thereof, said inlet means being in a flow relationship with said small end and said outlet means being in a flow relationship with said large end;
first piston means in said contoured cylinder;
a uniform cylinder in said housing and in substantially parallel alignment with said contoured cylinder;
second piston means in said uniform cylinder, said second piston means attached to said first piston means for movement therewith;
resilient means for urging said first piston means towards said small end of said contoured cylinder;
port means through said second piston means connecting fluid in said housing to said uniform cylinder;
means for measuring the movement of said first and second piston means;
said first piston means being moved axially along said contoured cylinder with said movement of said first and second piston means being a linear function of said fluid flowing through said housing of said flow meter, said second piston means and said port means compensating for changes in viscosity of said fluid.

3,910,113
METHOD OF SELECTIVELY VARYING THE DIFFERENTIAL OUTPUT AND OVERALL PERFORMANCE CHARACTERISTICS OF A PROPORTIONAL DIFFERENTIAL PRESSURE PRODUCING FLUID FLOW DEVICE

William R. Brown, 341 W. Mount Vernon St., Lansdale, Pa. 19446

Continuation-in-part of Ser. No. 308,031, Nov. 20, 1972, abandoned. This application Mar. 5, 1974, Ser. No. 448,280
Int. Cl.[2] G01F *1/46;* **G01P** *5/16*
U.S. Cl. 73—212 **4 Claims**

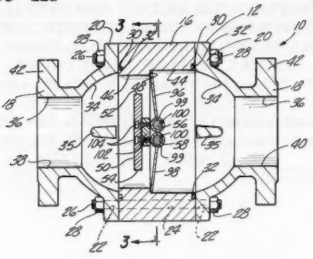


1. A method of selectively predetermining the differential output in a fluid flow system of a differential pressure producing fluid flow device in a conduit in said system, which device provides a restriction to fluid flow in said conduit, which restriction comprises at least one non-annular form connected to and extending inwardly from the wall of said conduit, comprising the steps of:
a. selecting a form of a given geometric configuration;
b. inserting the form so selected into said system in operative relation to said conduit;
c. measuring the differential output of said device at a plurality of flow rates and recording said measurements;
d. selecting a second form having the same geometric configuration as the first selected form, but having a different frontal area when viewed in the direction of fluid flow through said conduit;
e. removing the first selected form and inserting the second selected form into said conduit in operative relation thereto and measuring the differential output of said device at a plurality of given flow rates and recording said measurements;
f. selecting a further form having the same geometric configuration as the first two selected, but having a different frontal area than the first two selected when viewed in the direction of fluid flow through said conduit;
g. inserting said further selected form into said conduit in place of said second form and again measuring the differential output of said device at a plurality of given flow rates and recording said measurements;
h. correlating the recorded measurements as a function of differential output and frontal area for given flow rates;
i. extrapolating the correlated measurements;
j. and then for a desired differential output for a given flow rate, determining the frontal area of a form of the same geometric configuration to be used in said system to produce such differential output;
k. then inserting a form having said last mentioned frontal area and configuration into said system in operative relation thereto.

3,910,114
DUAL VANE FLOW METER

Nils O. Rosaen, Bloomfield Hills, Mich., assignor to Nancy Helen Rosean, Ann Arbor, Mich., a part interest

Filed Aug. 12, 1974, Ser. No. 496,728
Int. Cl.[2] G01F 1/28
U.S. Cl. 73—228 8 Claims

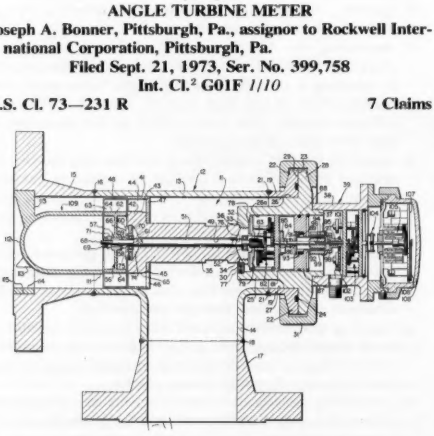


1. A flow meter for a fluid system comprising:
a housing having an inlet and an outlet adapted to be connected with said system,
a first and second vane rotatably mounted in said housing intermediate said inlet and said outlet, means linking said vanes to provide equal rotation in opposite directions;
said housing being provided with a substantially hemispherical interior wall section said first vane having a substantially semicircular edge rotatable adjacent one half of said hemispherical wall section and said second vane having a semicircular edge rotatable adjacent the second half of said hemispherical wall section,
the center of said hemispherical wall section being displaced from the center of the hemisphere circumscribed by the semicircular edge upon rotation of said vanes whereby the space between the semicircular edges of said vanes and said hemispherical wall section varies at each rotated position of said vanes, and
means indicating the position of one of said vanes exteriorly of said housing

3,910,115
ANGLE TURBINE METER

Joseph A. Bonner, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sept. 21, 1973, Ser. No. 399,758
Int. Cl.[2] G01F 1/10
U.S. Cl. 73—231 R 7 Claims

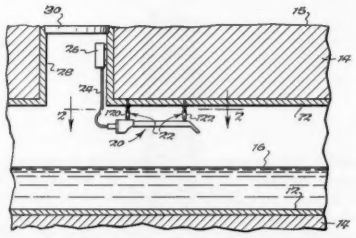


1. In a turbine meter, a body having oppositely extending hollow arms and an angularly intersecting hollow leg, means on one of said arms providing for coupling said body to an upstream pipeline section, means on said leg coupling said leg to a downstream pipeline section, and means mounting a meter mechanism in said body comprising an internal body member mounted in the other of said arms, a rotor support rigid with said internal body member and extending into said one arm, said rotor support comprising a coaxial hollow extension of said internal body member having an enlarged end portion within said one arm, said end portion having a fixed outer wall and defining an upstream open rotor chamber and an annular flow passage at the downstream side of said chamber, a rotor shaft extending through and rotatably mounted on said support projecting into said chamber, a rotor on said shaft within said chamber having peripheral blades aligned with said annular flow passage, a register mounted on said internal body member externally of said body, and means drive connecting said rotor shaft to said register.

3,910,116
TRANSDUCER POSITIONING MEANS FOR FLUID LEVEL MONITORING

Robert T. Smith, Williamsville, N.Y., assignor to Rexnord Inc., West Milwaukee, Wis.

Filed Dec. 7, 1973, Ser. No. 422,916
Int. Cl.[2] G01F 23/28
U.S. Cl. 73—290 V 10 Claims

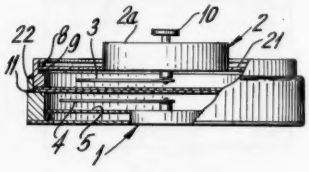


1. In a system for monitoring the level of a fluid in an enclosure wherein a transmitting and receiving transducer means produces energy pulses and detects pulses reflected from the surface of the fluid, means for positioning the transmitting and receiving transducer means above the fluid comprising:
a. an elongated frame means having a longitudinal axis;
b. means for mounting said frame means to said enclosure and above the fluid in a manner such that the longitudinal axis of said frame means is disposed generally parallel to the surface of of the fluid;
c. means defining a reflecting surface at one end of said frame means, said reflecting surface being disposed such that energy pulses traveling in a direction from the opposite end of said frame means toward said reflecting surface are directed by said surface toward the surface of the fluid and pulses reflected from the surface of the fluid toward said reflecting surface are directed by said surface toward the opposite end of said frame means;
d. means for holding said transmitting and receiving transducer means at the opposite end of said frame means so as to direct transmitted energy pulses toward said reflecting surface and to receive pulses reflected from said reflecting surface; and
e. said reflecting surface being spaced from said transmitting and receiving transducer means by a distance at least equal to the electrical dead band characteristic of said transmitting and receiving transducer means.

3,910,117
RATE OF ASCENT GUIDE DEVICE FOR UNDERWATER DIVERS

Roy Wicklund, 1 Alexander Ave., Merrick, Long Island, N.Y. 11566

Filed May 24, 1974, Ser. No. 473,248
Int. Cl.[2] G04B *47/06*
U.S. Cl. 73—291 23 Claims

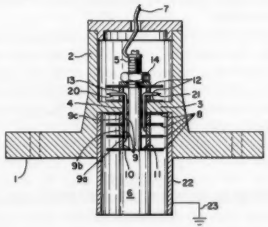


1. A rate of ascent guide device for underwater divers comprising:
   a. depth indicating means;
   b. rate of ascent timing guide means which simulate the operation of said depth indicating means during an ascent at a predesignated rate;
   c. means for powering the rate of ascent timing guide means;
   d. means adapted for synchronizing the depth indicating means with the rate of ascent timing guide means; and
   e. viewing means for maintaining the depth indicating means in synchronization with the rate of ascent timing guide means in ascending from underwater so that a diver's rate of ascent will be at the predesignated rate of ascent reflected by the operation of the rate of ascent timing guide means.

3,910,118
PROBE FOR CONTROLLING THE LEVEL OF ELECTRICALLY CONDUCTIVE LIQUIDS

Friedrich Schittek, and Heino Zimmermann, both of Bremen, Germany, assignors to Gustav F. Gerdts KG, Bremen, Germany

Continuation-in-part of Ser. No. 327,026, Jan. 26, 1973, abandoned. This application Jan. 18, 1974, Ser. No. 434,706
Claims priority, application Germany, Feb. 2, 1972, 2204805
Int. Cl.[2] G01F *23/22*
U.S. Cl. 73—304 R 5 Claims

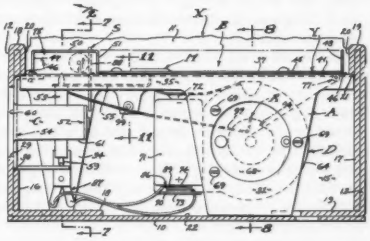


1. A probe for detecting the level of electrically conductive liquids in a container comprising:
   a measuring electrode rod;
   a housing for mounting said electrode rod to the wall of said container, said electrode rod extending through a wall of said housing into said container;
   a plurality of spaced-apart insulating discs radially surrounding said electrode rod;
   a plurality of annular and conductive distance spacers insulatedly surrounding said electrode rod and disposed between said insulating discs, said insulating discs and said distance spacers being secured inside the container so as to seal and insulate said electrode rod from said housing;
   an electrical bridge circuit coupled to said electrode and housing for liquid level indication; and
   a counter electrode arranged at a defined distance from said electrode rod and said distance spacers, wherein one of said distance spacers comprises a compensating electrode forming a resistance path common with the liquid of the container with respect to the counter electrode, said resistance path serves as a resistor in one branch of the bridge circuit and the resistance path between said electrode rod and said counter electrode serves as a resistor in another branch of the bridge circuit and said two branches are connected in series to each other with respect to a power source coupled to the bridge circuit.

3,910,119
RECORDING THERMOMETER

William H. Maxwell, West Los Angeles, Calif., assignor to Cargo Graphics Corporation, Los Angeles, Calif.

Filed May 15, 1972, Ser. No. 253,202
Int. Cl. G01k *1/02*
U.S. Cl. 73—343.5 8 Claims

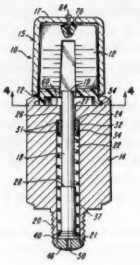


1. An instrument for recording a line variably displaced between opposite side margins of an elongated chart transported therethrough and adapted to be written upon, and including; a frame having an upwardly faced planar table portion supportably engaging the chart and having a transverse opening adjacent one end of the table portion and extending between the opposite side margins of the chart, a planar facia spaced from the table portion of the frame forming a chart passage therebetween and having a writing opening substantially coextensive with said planar table portion and having a downwardly faced transverse platen portion overlying the said transverse opening adjacent one end of the table portion of the frame, drive means transporting the elongated chart through said passage to pass beneath the platen portion of the facia, and a condition recording means comprising a stylus engageable with the chart through said transverse opening in the frame and displaceable between the opposite side margins of the chart to record a line thereon.

3,910,120
PRESSURE GAUGE HAVING INTERCHANGEABLE INDICATOR COMPONENTS AND POSITIVE PISTON STOP

Clyde J. Martin, Cincinnati, Ohio, assignor to Martin Industries, Inc., Cincinnati, Ohio

Filed Mar. 20, 1974, Ser. No. 452,791
Int. Cl.[2] G01L *7/16*
U.S. Cl. 73—419 **8 Claims**



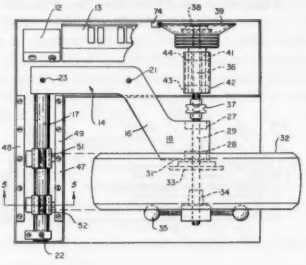
1. A pressure gauge comprising:
an elongate body member having a bore extending axially therethrough;
a piston slidably mounted within said bore for movement between a fully retracted position and advanced positions wherein portions of the piston project beyond the body member from one end of the bore;
a compression spring within said bore normally urging said piston to a fully retracted position;
means securely though releasably closing the other end of said bore for retaining the piston and spring within the bore, said means having a passageway therethrough in open communication with the interior of the bore at said other end thereof;
that end of the body member adjacent the said one end of the bore terminating in a transverse end-face circumscribed by a continuous, annular, tab-receptive groove;
a calibrated indicator securely though releasably mounted on said body member at said end face and projecting longitudinally outward from said one end of the bore; and said indicator including a base portion having a plurality of resilient, axially projecting lock-tabs in snap-detented relationship with said groove for mounting the indicator to the body member.

3,910,121
DYNAMIC BALANCING MACHINE

Donald B. Curchod, Avalon, and Allan C. Madden, Killarney Heights, both of Australia, assignors to Nortron Corporation, Mountain View, Calif.

Filed Aug. 28, 1973, Ser. No. 392,194
Int. Cl.[2] G01M *1/22*
U.S. Cl. 73—462 **11 Claims**

1. A balancing machine for balancing a rotating member comprising a force transmitting member including a force arm, means for supporting said force transmitting member so that it can move substantially only in one plane, a drive shaft for driving said rotating member mounted on said force transmitting member spaced from and having its axis parallel to said force arm, means for mounting the member to be balanced on one end of said drive shaft opposite said force arm, a fixed member disposed adjacent said force arm in said plane of movement, a force transducer adapted to be disposed between said force arm and said fixed member opposite a predetermined plane of said rotating member serving to generate an electrical signal proportional to force, means for holding said force arm and fixed member in cooperation with the transducer, means including a flexible coupling for driving the other end of said drive shaft and associated rotating member whereby to generate imbalance forces which are transferred by said force transmitting member to said transducer through

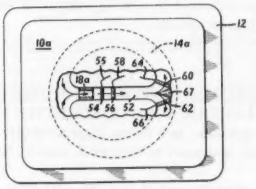


said arm and means connected to receive said electrical signal and generate a first signal proportional to the force whereby to indicate the amount of imbalance of the rotating member at a position opposite said force transducer.

3,910,122
ANGULAR VELOCITY MEASURING APPARATUS USING IONIZED GAS IN AN ENDLESS LOOP

John L. Evans, Oakland; Jay Hoffman, Livingston, and Lincoln S. Ferriss, Madison, all of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Oct. 31, 1973, Ser. No. 411,538
Int. Cl. G01p *15/08*
U.S. Cl. 73—516 LM **19 Claims**



1. Apparatus for use in measuring the angular velocity of an object comprising:
a. conduit means forming a closed loop fixed to said object for containing a gas;
b. an ionizable gas contained in said conduit means;
c. ion collecting means comprising first and second ion collecting grids spacedly disposed and fixedly positioned in said conduit;
d. means located between said first and second ion collecting grids for ionizing said contained gas and thereby moving the same relative to said conduit; and
e. means responsive to said first and second ion collecting grids for providing an output signal indicative of changes in ion collection thereby.

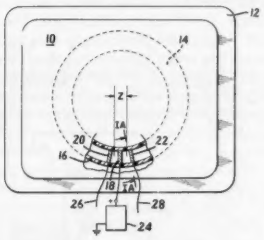
3,910,123
APPARATUS FOR THE MEASUREMENT OF ANGULAR VELOCITY

John Evans, Oakland; Jay Hoffman, Livingston, and Bart J. Zoltan, Emerson, all of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Oct. 23, 1973, Ser. No. 408,313
Int. Cl. G01p *15/08*
U.S. Cl. 73—516 LM **9 Claims**

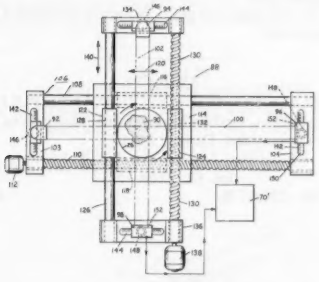
1. Apparatus for use in measuring the angular velocity of an object comprising:

a. conduit means forming a closed loop secureable to said object for containing a gas;
b. a gas in said conduit means having electrical charges of opposite polarities consisting of electrons and positive ions;
c. first and second electrode means fixedly and spacedly disposed in said conduit means;



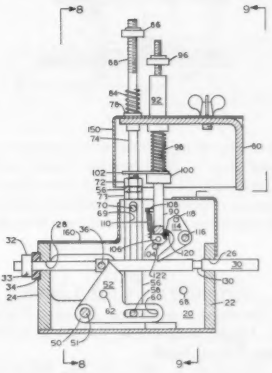
d. first circuit means connected to said first electrode means for providing said first electrode means with an electrical potential whereby said first electrode means collect electrons from said gas; and
e. second circuit means connected to said second electrode means and generating an output signal indicative of positive ions incidence of said second electrode means said electrical potential provided to said electrode means being of a polarity with respect to the electrical potential of said second electrode means.

3,910,124
NON-DESTRUCTIVE TESTING PROCEDURES
George H. Halsey, 63 Shady Dr., Indiana, Pa. 15701
Filed July 14, 1971, Ser. No. 162,510
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.6 **21 Claims**



1. A non-destructive testing arrangement comprising a penetrative energy source capable of emitting an energy envelope, means for expanding said envelope primarily in one plane, a receiver assembly positioned to intercept said envelope and capable of developing proportional electric signals upon reception of said energy, means for mounting said source and said receiver assembly in spaced alignment, means for mounting a test object intermediate said source and said receiver assembly so as to intercept at least a portion of said envelope, said receiver assembly including a tandem array of individual receivers, said array being aligned with said plane, and means for relatively moving said test object mounting means along a path extending between said source and said receiver assembly in substantial alignment with said energy envelope while maintaining one of said object mounting means and said energy source and receiver assembly substantially and relatively in place to produce a zoom effect of any flaws of said object at an image made on said receiver assembly.

3,910,125
STORED ENERGY EJECTOR MECHANISM
Walter M. Nowikas, Morris Plains, N.J., assignor to Donley, Miller & Nowikas, Inc., East Hanover, N.J.
Filed July 3, 1974, Ser. No. 485,499
Int. Cl.[2] G05G *17/00*
U.S. Cl. 74—2 **15 Claims**

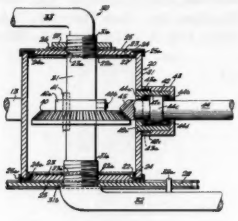


1. A stored energy ejector mechanism adapted for mounting on a punch press, a conveyor support and like apparatus wherein workpieces are to be selectively removed at selected times in the operation thereof, said ejector mechanism including: (a) a housing; (b) an ejector plunger reciprocably carried in guideways provided in said housing; (c) biasing means associated with the ejector plunger and adapted to move the plunger in one direction; (d) means for limiting the extent of movement of the plunger in said one direction; (e) at least one actuator lever movable so as to engage the plunger and move the plunger counterflow to the bias urged direction and to a "loaded" biased position; (f) an energizer shaft operatively connected to the actuator lever, said energizer shaft operatively moved by the apparatus on which the ejector mechanism is mounted; (g) trigger means in association with the ejector plunger and adapted to engage and retain said ejector plunger in a "cocked" condition as and after the actuator lever has moved the plunger to its biased loaded condition, and (h) trigger release means associated with and moved by the apparatus to and on which the ejector mechanism is mounted, said trigger release means when actuated removing the retaining engagement of the trigger and permitting the released plunger under the influence of the bias means to move rapidly to its limited extent of movement.

3,910,126
POWER TAKE-OFF FROM BICYCLE CRANK
Arnold Felder, 821 82nd St., Miami Beach, Fla. 33141
Filed June 20, 1974, Ser. No. 481,348
Int. Cl.[2] F16H *37/00*
U.S. Cl. 74—11 **4 Claims**

1. A pedal bicycle with power take-off comprising a frame including a down tube, a seat supporting tube and a rear fork, all attached to and radiating from a journal box tubular casing, a pedal crank having a center section between a pair of radially extending arms, said center section extending through said casing and being rotatably supported by a pair of bearing means mounted in opposite ends of the casing, a drive

sprocket for a bicycle chain mounted to turn with said center section and located beyond one of said casing opposite ends; power take-off means from said crank center section comprising a gear within said journal box casing mounted on and rotating with said crank center section between said bearing



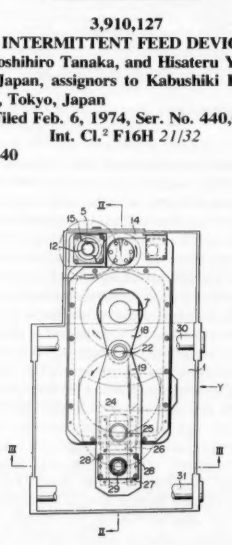
means, said casing being formed with an opening located for access to said gear, a third bearing means secured to said casing in said opening and rotatably mounting a drive shaft having its axis of rotation radially to said casing, and a pinion terminating said drive shaft meshing with said gear.

3,910,127

INTERMITTENT FEED DEVICE

Eiji Ohno; Toshihiro Tanaka, and Hisateru Yamashita, all of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 6, 1974, Ser. No. 440,052
Int. Cl.[2] F16H *21/32*
U.S. Cl. 74—40 **3 Claims**



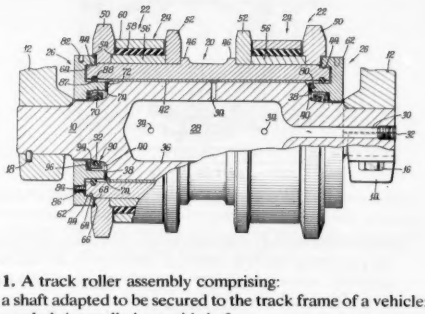
1. An intermittent feed device comprising first and second shafts rotatably supported on a feed box and engaged with each other by gears connected through a transmission gear mechanism to a drive shaft, first and second cranks fixed to said first and second shafts, respectively, a link wherein said first crank is rotatably connected to said link, a slider provided on said second crank, said link having a long hole formed axially therein wherein said slider is inserted into the long hole of said link, a roller supported on said link, a carrier reciprocatingly coupled to the feed box in its transferring direction and having a sliding groove formed therein wherein said roller is inserted into the sliding groove of said carrier whereby the rotation of said drive shaft rotates said first and second cranks and said link is thereby moved, the movement being guided by said slider, whereby said carrier is reciprocated by the movement of said roller in said sliding groove of said carrier.

3,910,128

TRACK ROLLER HAVING RESILIENT MOUNTED TREADS AND THREADED-ON RETAINERS

Roger L. Boggs, East Peoria, and Delbert D. Dester, Washington, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed June 13, 1974, Ser. No. 479,167
Int. Cl.[2] F16H *55/36;* **B62D** *55/14*
U.S. Cl. 74—230.01 **8 Claims**



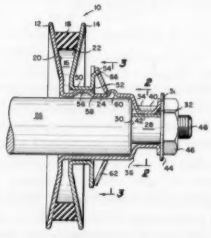
1. A track roller assembly comprising:
a shaft adapted to be secured to the track frame of a vehicle;
a hub journalled on said shaft;
at least two removable guide flanges disposed on said hub, each said guide flange being symmetrical whereby when one side thereof becomes worn, the same may be removed, reversed and replaced;
a pair of abutments on said hub;
a pair of removable spacing sleeves on said hub, one associated with each abutment;
a pair of resilient collars, each extending peripherally about and mounted on a corresponding one of said sleeves;
a pair of treads, each extending peripherally about and mounted on a corresponding one of said collars,
said guide flanges being in abutment with a corresponding one of said sleeves oppositely from the corresponding abutment; and
means for securing said guide flanges in assembled relation with said hub.

3,910,129

VARIABLE DIAMETER SPLIT-FLANGE PULLEY

Ronald L. Phillips, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 7, 1973, Ser. No. 422,698
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 B **4 Claims**

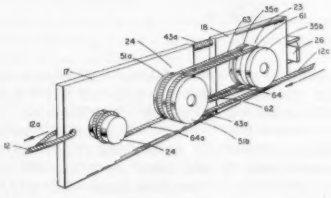


1. An adjustable pulley having a variable effective diameter drivingly engaging a V-belt at the effective diameter comprising in combination; a shaft, a fixed pulley flange and integral hub positioned upon and secured to said shaft for rotation therewith, a reciprocable pulley flange and integral hub coaxially positioned upon said fixed pulley flange hub for axial

reciprocable movement relative to said fixed hub, said fixed and reciprocable hubs both having aligned portions drivingly connecting said fixed and reciprocable pulley flanges, a Belleville spring, means on said fixed hub supporting the internal circumferential surface of said spring, and means on said reciprocable hub engaging a portion of the outer circumferential surface of said spring retaining said spring in engagement with said fixed hub supporting means whereby said adjustable pulley is secured in assembled relationship, said spring continuously biasing said reciprocable pulley flange relative to said fixed pulley flange into engagement with said V-belt.

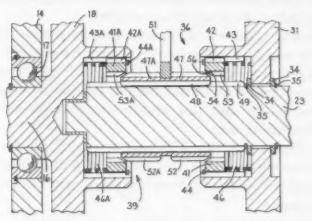
4. An adjustable pulley of stamped sheet metal construction having a variable effective diameter drivingly engaging a V-belt at the effective diameter comprising in combination; a shaft, a fixed pulley flange and integral hub of stamped sheet metal construction positioned upon and secured to said shaft for rotation therewith, said shaft containing a spline groove, said integral hub including a depressed internally extending male spline mating with said shaft groove providing the driving connection therebetween, a reciprocable pulley flange and integral hub of stamped sheet metal construction coaxially positioned upon said fixed hub for axial reciprocable movement relative to said fixed hub, said fixed and reciprocable hubs each having a splined portion in mating engagement drivingly connecting said fixed and reciprocable flanges, said stamped sheet metal fixed hub having three equiangularly spaced projections extending radially outwardly therefrom, a Belleville spring, said spring having three equiangularly spaced notches in an internal circumferential surface of said spring, said spring being coaxially positioned upon said fixed hub with said notches receiving the three equiangularly spaced projections on said fixed hub permitting axial movement of said spring past said projections relative to said fixed hub, a radially extending flange on said reciprocable hub, and a locking tang struck from the outer periphery of said radially extending flange, said Belleville spring containing a locking notch whereby rotation of said spring aligning said tang with said notch positions said spring notches out of alignment with said hub projections and said spring being seated against said projections, said tang engaging said spring notch when said spring is slightly depressed and the subsequent release thereof applying a spring force against said hub projections and said tang positively retaining the pulley assembled.

3,910,130
SELF-TENSIONING CABLE DRIVE
Charles W. Traughber, Jr., Box 88C, Candler, N.C. 28715
Filed Oct. 29, 1974, Ser. No. 518,572
Int. Cl.² F16H *7/08, 7/00*
U.S. Cl. 74—242.9 **10 Claims**



1. A self-tensioning, endless rope drive system comprising rotating drive pulley means accommodating a rope on a portion of its peripheral surface, the rope extending tangentially from the pulley means, then around a sheave spaced from the pulley means and returning tangentially to the pulley means so that as the drive pulley means rotates, one portion of the rope moves onto said drive pulley means under high tension and another portion moves off said drive pulley means under lower tension, a load-engaging member carried by said rope and adapted to be moved between said sheave and said pulley means, and force transferring means extending between said load-engaging member and said rope for applying a predetermined portion of the driving force necessary to move the load engaged by said member to said lower tension portion of the rope.

3,910,131
TRANSMISSION WITH SNAP SHIFT
Elmer A. Richards, Oshtemo, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Mar. 20, 1974, Ser. No. 452,727
Int. Cl.² F16H *3/08, 3/38;* **F16D** *11/10, 21/02*
U.S. Cl. 74—331 **21 Claims**



1. A change speed gear device, comprising:
first and second substantially parallel shaft members;
gear means drivingly connectible between said shaft said shaft members for providing a plurality of alternately selectable speed ratios, said gear means including a first rotatable gear member supported on said first shaft member and a second rotatable gear member substantially concentric with said second shaft member and meshable with said first gear member, said second gear member being axially fixed relative to said second shaft member; clutch means for selectively drivingly connecting said second gear member to said second shaft member, said clutch means including a first annular jaw clutch member nonrotatably connected to said second gear member for rotation therewith and a second annular jaw clutch member nonrotatably associated with said second shaft member for rotation therewith, said first jaw clutch member also being mounted for axial movement relative to said first gear member;
first means coacting with said first jaw clutch member for resiliently urging said first jaw clutch member in an axial direction toward said second jaw clutch member for causing resiliently urged meshing engagement of said jaw clutch member in response to relative axial shifting movement of said first and second jaw clutch members toward one another; and
second means coacting with said first jaw clutch member and acting in opposition to the urging of said first means for normally maintaining said first jaw clutch member in a selected axial position relative to said second gear member when said jaw clutch members are disengaged, relative axial movement of said first and second jaw clutch members toward one another causing said first and second jaw clutch member to contact one another whereby said first means causes said jaw clutch members to meshingly engage when substantial speed synchronization is achieved therebetween.

13. In a transmission, the combination comprising:
a housing;
a plurality of spaced and substantially parallel countershafts mounted within said housing;
a plurality of countershafts ration gears mounted on each of said countershafts, the individual ratio gears on one countershaft being grouped with and radially spaced from identical ratio gears on the other countershafts for defining countershaft gear groups;

a main shaft member disposed between and substantially parallel with said plurality of countershafts;

a plurality of main ratio gear members disposed substantially concentrically on said main shaft member, each of said main ratio gear members being disposed in continuous meshing engagement with and radially floatably supported by a respective one of said countershaft gear groups;

releasable clutch means associated with one of said main ratio gear members for selectively nonrotatably interconnecting same to said main shaft member, said clutch means including first and second annular jaw clutch members nonrotatably associated with said one main gear member and said main shaft member, respectively, at least one of said jaw clutch members being axially slidably mounted on its respective member;

first means coacting with said clutch means for axially urging said first and second jaw clutch members relatively toward one another for creating a resilient engaging force to cause said clutch members to meshingly engage when the speed of said jaw clutch members is substantially synchronized; and

second means coacting with said clutch means for normally maintaining said first and second jaw clutch members in an axially spaced relationship when said clutch means is disengaged.

21. A change speed gear device, comprising:

first and second substantially parallel shaft members;

gear means drivingly connectable between said shaft members for providing a plurality of alternately selectable speed ratios, said gear means including a first rotatable gear member supported on said first shaft member and a second rotatable gear member substantially concentric with said second shaft member and meshable with said first gear member, said second gear member being axially fixed relative to said second shaft member;

clutch means for selectively drivingly connecting said second gear member to said second shaft member, said clutch means including a first annular jaw clutch member nonrotatably connected to said second gear member for rotation therewith and a second annular jaw clutch member nonrotatably associated with said second shaft member for rotation therewith, said first jaw and clutch member also being mounted for axial movement relative to said first gear member, and

first means coacting with said first jaw clutch member for resiliently urging said first jaw clutch member in an axial direction toward said second jaw clutch member for causing resiliently urged meshing engagement of said jaw clutch member in response to relative axial shifting movement of said first and second jaw clutch members toward one another, relative axial movement of said first and second jaw clutch members toward one another causing said first and second jaw clutch member to contact one another whereby said first means causes said jaw clutch members to meshingly engage when substantial speed synchronization is achieved therebetween.

3,910,132
TANDEM DRIVE SHAFT ARRANGEMENT

Kunto Elonen, Tampere, Finland, assignor to Rauma-Repola Oy., Tampere, Finland

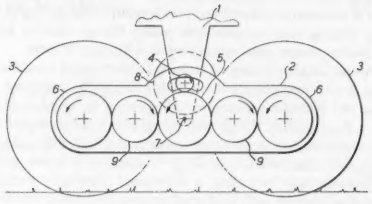
Filed Apr. 16, 1974, Ser. No. 461,454

Claims priority, application Finland, Apr. 27, 1973, 1351/73

Int. Cl.[2] **F16H** *35/00*; **B62D** *3/00*, *61/00*

U.S. Cl. 74—384 **3 Claims**

1. A tandem drive shaft arrangement including a transmission means comprising a casing pivotably mounted at its center to the frame of a vehicle, a pair of wheels each with a rotatable driving means coaxially secured thereto and supported at opposite ends of said casing in tandem relationship a central rotatable driving member supported on said casing in substantially axial alignment with the point about which said casing is pivotable, rotatable coupling means for transmitting rotation between said central rotatable driving member and each of said rotatable wheel driving members, and a rotatable power transmitting member of smaller operative diameter than said central rotatable driving member supported on said vehicle frame above said central rotatable



driving member in driving arrangement therewith throughout the range of pivotable movement of said casing, the dimensions of said rotatable power transmitting member, said central rotatable driving member, said rotatable coupling means and said wheel driving means being so related as to maintain a substantially **1:1** driving range between said wheels throughout the range of pivotable movement of said casing.

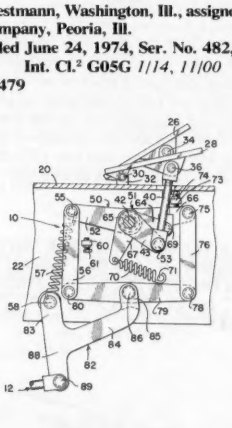
3,910,133
CONTROL LINKAGE FOR HYDROSTATICALLY POWERED DRIVE AND STEERING SYSTEM OR THE LIKE

Eldon Dale Oestmann, Washington, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed June 24, 1974, Ser. No. 482,511

Int. Cl.[2] **G05G** *1/14*, *11/00*

U.S. Cl. 74—479 **10 Claims**



1. In a bidirectional control arrangement having a pair of individually operative pedals pivoted on a housing and an output member linearly reciprocable between a neutral position and two opposite extreme positions, in combination with an actuator mechanism for transmitting movement of said pedals to movement of said output member, said actuator mechanism comprising a cross-shaft, a pair of levers keyed to said cross-shaft and extending generally in opposite directions from said cross-shaft, one of said levers being connected to one of said foot pedals and the other of said levers being pivotally connected to a link, a sleeve concentrically mounted on said cross-shaft and having first ans second radially extending levers connected thereto, the first of said levers being connected to the other of said foot pedals, the second of said levers extending from the same side of the sleeve as said first lever and being pivotally connected to a link, a balance lever pivotally connected at one end to the link on the other lever on the cross-shaft and connected at the other end to the link

on the second lever on said sleeve, a crank pivotally mounted on the housing and having one lever connected to the midpoint of the balance lever and having another lever connected to the output member whereby downward movement of either pedal will pivot the balance lever and move the output member toward one of the extreme positions.

3,910,134
CARBURETOR THROTTLE VALVE SAFETY DEVICE

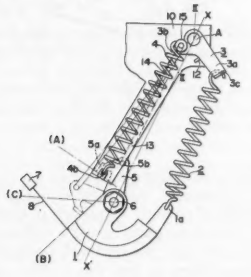
Toshimichi Akagi, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Japan

Filed Sept. 26, 1973, Ser. No. 400,815

Claims priority, application Japan, Sept. 30, 1972, 47-113746

Int. Cl. G05g *1/14*

U.S. Cl. 74—513 **3 Claims**



1. A safety device for controlling a carburetor throttle valve coupled to a throttle shaft, comprising:

a throttle lever rigidly fixed to said throttle shaft to rotate integrally therewith;

a spring attaching lever rotatably attached to a carburetor body and having a larger projection at one end and a smaller projection at the other end, said larger projection having more weight than said smaller projection in respect of a rotatable center point of said spring attaching lever;

a main return spring connected to said larger projection of said spring attaching lever and said throttle lever and giving both an inward tension;

an auxiliary throttle lever rotatably attached to said throttle shaft;

a bracket with a guide slot rigidly attached to said carburetor body;

a connecting rod having one end rotatably attached to said auxiliary throttle lever, and the other end being bent and placed on an upper edge of said smaller projection of said spring attaching lever and received movably within said guide slot of said bracket;

an auxiliary return spring having one end fixed to said bracket and the other end mounted on said bent end of said connecting rod, and giving an inward pull between the two points; and

a stopper rigidly attached to said bracket under a lower edge of said larger projection of said spring attaching lever to limit further rotation.

3,910,135
ACCELERATOR HOLDING DEVICE

Alan C. Phillips, 19447 Baugh St. NW., Elk River, Minn. 55330

Filed Apr. 25, 1974, Ser. No. 464,203

Int. Cl.[2] G05G *5/12*

U.S. Cl. 74—532 **4 Claims**

1. An accelerator pedal holding device for an atuomotive vehicle, comprising

an elongate, longitudinally adjustable, accelerator pedal engaging structure, including an elongate lower member having a plurality of penetrating elements at one end thereof for engaging the upper surface of the accelerator pedal with penetrating effect,

an elongate, upper member telescopically engaging said lower member, cooperating means on said members permitting relative longitudinal adjustment therebetween, a mounting structure, mounted on said upper member and including a generally angular seat engaging portion adapted to engage the upper and front surfaces of the vehicle seat, and a generally arcuate steering wheel engaging portion adapted to engage the steering wheel of the vehicle, an intermediate portion integral with said seat engaging portion and with said steering wheel engaging portion, aligned openings in said seat engaging portion and said intermediate portion through which said upper member projects to mount said mounting structure on said upper member, said mounting structure when engaging the vehicle steering wheel or the vehicle seat, and said accelerator pedal engaging structure when engaging the accelerator pedal urging the latter into a predetermined depressed condition to cause the vehicle to idle at a predetermined rate of speed.

3,910,136
PROTECTION APPARATUS FOR A SPEED CHANGE MECHANISM OF A BICYCLE OR SIMILAR VEHICLE

Lucien Charles Hippolyte Juy, 75 rue General Fauconnet, Dijon-Cote-d'Or, France

Filed Apr. 11, 1974, Ser. No. 460,212

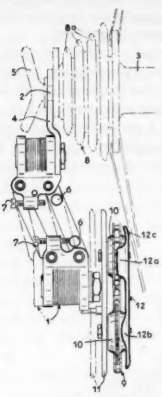
Claims priority, application France, Apr. 16, 1973, 73.14269

Int. Cl.[2] F16D *1/00*

U.S. Cl. 74—611 **14 Claims**

1. Protection apparatus for a speed change mechanism mounted on a spoked rear wheel of a vehicle in which a chain is transversely displaced by a roller assembly to effect speed change, said protection apparatus comprising a counter-flange on the roller assembly disposed between the rear wheel and the roller assembly, said counter-flange having a peripheral edge with a plurality of bend regions at locations where the counter-flange could contact the spokes of the wheel if the

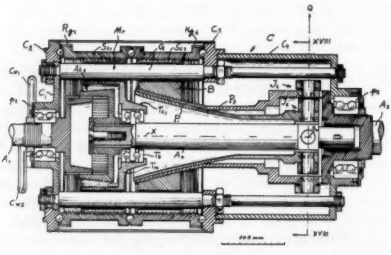
roller assembly were excessively displaced towards said spokes, said bend regions being bent in a direction away from the rear wheel to prevent insertion of the counterflange between the spokes of the rear wheel.



3,910,137
ROTATIVE TRANSMISSIONS AT INFINITELY VARYING RATIOS

Radovan Nedeljkovitch, 8 Square du Dragon, Residence St. Michel, Le Chesnay, France (78150)

Filed Nov. 7, 1973, Ser. No. 413,555
Claims priority, application France, Nov. 17, 1972, 72.40848; Feb. 19, 1973, 73.05724
Int. Cl.[2] F16H *15/16, 15/50*
U.S. Cl. 74—796 **8 Claims**

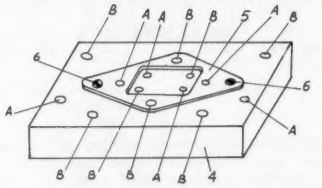


1. A motion converting device comprising: a fixed base having a longitudinal axis of symmetry and defining an internal closed rolling contact path, a tapered rolling pendulum member disposed within the base and having an external rolling contact path and a longitudinal axis of rotation, said rolling contact paths being adapted for continuous rolling contact with one another and being of complementary arcuate shape with substantially equal radii of curvature and a common center which is radially spaced from the longitudinal axis of the base at all times, means for rotatively supporting the pendulum within the base for continuous rolling contact therebetween, input means for rotatively driving the pendulum member and means for shifting the pendulum along the axis of the base while maintaining the rolling contact and continuous intimate tangential bearing of said pendulum rolling path against said base rolling path thus to produce rolling rotation of the pendulum around the inside of the base with a resulting orbital travel of the axis of the pendulum around the axis of the base, the axial shifting of the pendulum being such as to cause angular departure between the axis of rotation of the pendulum and the longitudinal axis of the base and output means associated with said pendulum for deriving an output therefrom.

3,910,138
DIES AND PUNCHES FOR PRODUCING PRESSED COMPONENTS

Rathin Sinha, and Pradeep Sinha, Poona, India, assignors to Samarendra Narayan Sinha, Poona, India

Filed Mar. 6, 1974, Ser. No. 448,570
Int. Cl.[2] B21K *5/20*
U.S. Cl. 76—107 C **13 Claims**

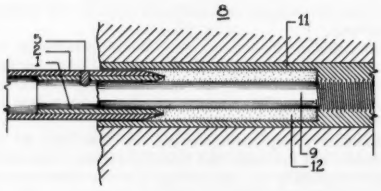


1. A method of manufacturing a die or a punch for producing pressed components, said method comprising shearing under application of pressure thin sheets of conducting material between a top press-plate having a resilient contact face and a bottom press-plate provided with a plurality of locating holes and fixing holes, so that the profiles of the sheared pieces of conducting material are faithful reproductions of the profiles of the cutting edges of the bottom press-plate and of the locating holes and the fixing holes; stacking a plurality of said cut pieces of conducting material to form electrodes and spark-eroding a semi-finished metal block by said electrodes to produce a die or a punch.

3,910,139
ROCK BOLT REMOVER

Dino Blaskovic, Box 1163, Yellowknife, Northwest Territories, Canada

Filed Nov. 8, 1974, Ser. No. 521,958
Claims priority, application Canada, Feb. 12, 1974, 192342
Int. Cl.[2] B25B *13/50*
U.S. Cl. 81—53.2 **5 Claims**

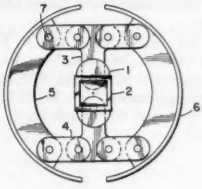


1. A tool for removing broken rock bolts comprising: a hollow cylindrical pipe having a tapered wall at one end extending from its inside surface at that end, a short distance along the length, to the outside surface and having, adjacent to the other end, two diametrically opposed holes; a hollow cylindrical sleeve insert of hard material extending part way along the length of the tool from its mouth end and secured thereto, said insert having an inside diameter slightly larger than the diameter of a rock bolt shaft and tapered back from the mouth of the tool a short distance with said taper meeting the taper of the pipe in an annular edge; a gripping surface directed inward from the inside surface of the cylindrical insert extending partially into the interior thereof.

3,910,140
OIL FILTER TOOL

Ivan L. Rose, Rt. 2, Box 1416, Burleson, Tex. 76028

Filed Dec. 6, 1973, Ser. No. 422,544
Int. Cl.[2] B25B 13/50
U.S. Cl. 81—90 B 4 Claims

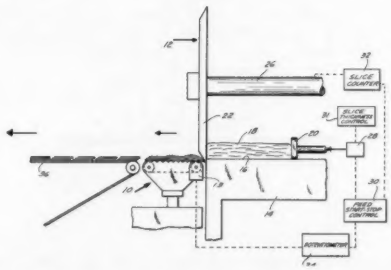


1. A tool for turning cylindrical objects, comprising a first semi-circular member having an upper and lower surface, a second semi-circular member having an upper and lower surface, first and second arc-shape members secured to said first and second semi-circular members, respectively, at the upper surface thereof, a grpping surface formed by said lower surface of each of said semi-circular members for grasping an object to be turned, linkage means pivotally connecting said first and second semi-circular members, said linkage means being pivotally secured to operate ends of each of said first and second arc shape members, and a socket means pivotally secured to said linkage means for receiving a torqueing tool whereby torque applied to said socket means will operate the linkage means to bring the gripping surface of each of said semi-circular members into engagement with the object to be turned.

3,910,141
APPARATUS FOR SLICING FOOD PRODUCT AND SEPARATING DRAFTS OF SLICES

William J. Divan, Centerport, N.Y., assignor to Cashin Systems Corporation, Williston Park, N.Y.

Filed Aug. 16, 1974, Ser. No. 498,175
Int. Cl.[2] B26D 4/46
U.S. Cl. 83—26 5 Claims

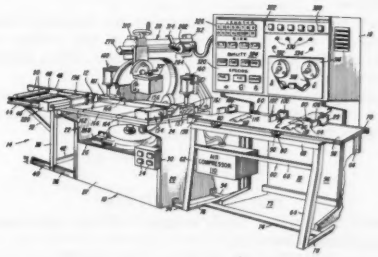


1. The combination of
a. a slicing machine having:
a slicing blade;
feed mechanism for feeding products to be sliced into the blade;
a first control for interrupting the operation of the feed mechanism; and
b. receiving and conveying apparatus for receiving the sliced products from the slicing machine and conveying the sliced products away comprising:
a motorized conveyor normally run at low speed and adapted and positioned to receive a plurality of drafts of the sliced product from the slicing machine in shingled fashion, said motorized conveyor having means to be jumped ahead at high speed to form separations between the drafts on the motorized conveyor;
a second control for jumping the motorized conveyor ahead at high speed;
a third control for counting the revolutions of the slicing blade, the said third control being interconnected to the first and second controls to permit a draft of a predetermined number of slices to be fed onto the motorized conveyor in shingled fashion, the feed mechanism to be interrupted for a predetermined number of revolutions of the slicing blade, and the motorized conveyor to be jumped ahead at high speed during the interruption of the feed mechanism, whereby the drafts of shingled slices on the motorized conveyor will have separations between drafts.

3,910,142
AUTOMATED SAW

John C. Jureit, Coral Gables, Fla., and Lawrence A. Hoffman, Potomac, Md., assignors to Automated Building Components, Inc., Miami, Fla.

Continuation of Ser. No. 113,012, Feb. 5, 1971, which is a division of Ser. No. 549,624, May 17, 1966, Pat. No. 3,610,299. This application Nov. 28, 1973, Ser. No. 419,819The portion of the term of this patent subsequent to Oct. 5, 1988, has been disclaimed.
Int. Cl. B27b 5/20; B26d 5/30
U.S. Cl. 83—71 13 Claims



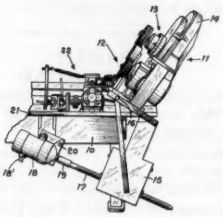
1. A cutting machine comprising a framework including a cutting surface comprised of a table adapted for receiving a wooden member, cutting means comprising a blade, first control means for providing a first motion to said blade to effect a cut on said wooden member, second control means for providing a second motion to said blade relative to said wooden member for engaging said blade with said wooden member; reference position means including a guide fence for supporting and aligning said workpiece in relation to said blade, a carriage mounted on said framework for movement therealong, a plurality of stops carried by said carriage and movable therewith along said cutting surface and parallel to said fence for establishing distances of cuts between said blade and said stops, each of said stops being movable from a first position spaced from said cutting surface into a second position providing an abutment for an end of said wooden member, means for moving said stops from said first position to said second position, means for positioning said carriage along said framework and thereby positioning said stops relative to said cutting surface to establish select cutting distances between said stops and said blade; means providing data in the form of electrical signals representing a predetermined distance between a selected stop and said blade, means responsive to said signals for controlling said positioning means to locate said carriage in a position whereby said selected stop is located at a the predetermined distance from said blade, said signal responsive means including means for actuating the stop moving to move said selected stop from a first to a second

position, and means for clamping said wooden member to said table surface thereby holding said wooden member rigid during a cutting operation.

3,910,143
ADJUSTABLE SLICING APPARATUS

Charles H. Wallace, Carrollton, Va.; Hubert E. Tobey, Milltown, N.J.; John W. Hood, East Brunswick, N.J., and Dee L. Irvin, Moonachie, N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 31, 1973, Ser. No. 393,520
Int. Cl.[2] B26D *1/56, 7/06*
U.S. Cl. 83—342 **17 Claims**

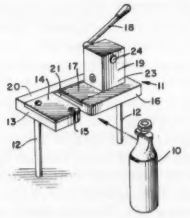


1. Slicing apparatus comprising in combination:
a support frame and cutting anvil;
a rotating slicer blade assembly pivotally mounted on said frame;
means coupled to the blade assembly for angularly displacing said blade assembly forwardly of said cutting anvil from a first cutting position to a second cutting position; and
means for feeding a slab of material to be sliced across said anvil and into the path of the rotating blade of said assembly in the second cutting position.

3,910,144
BOTTLE TOP CUTTER

Harold S. Hess, Irvine, Calif., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Feb. 20, 1974, Ser. No. 444,068
Int. Cl.[2] B23D *23/00, 15/04*
U.S. Cl. 83—440.1 **6 Claims**



1. An apparatus for severing the tip portion of a thermoplastic bottle along the flattened sides of the constricted neck portion of said bottle comprising at least two upright standards in spaced relationship from each other, a horizontal plate means affixed to one standard, a horizontal plate means affixed to the other standard, means for rigidly joining both said plate means and said standards, both of said plate means being in the same plane and in spaced relationship, said two plate means and said means for rigidly joining both plate means defining a space laterally enterable wherein the to-be-cut thermoplastic bottle is positioned, a movable cutting blade positioned on one of said plate means, means for moving said cutting blade towards said other plate means across said space.

3,910,145
APPARATUS FOR CUTTING A MAT OF BONDED FIBER

David John Bender, Toledo, and Frank Steve Kubovich, Rossford, both of Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

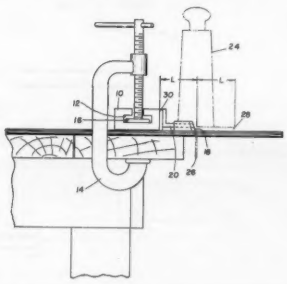
Division of Ser. No. 403,682, Oct. 4, 1973, which is a continuation of Ser. No. 203,410, Nov. 30, 1971, abandoned, which is a continuation of Ser. No. 875,140, Nov. 10, 1969, abandoned. This application Mar. 20, 1974, Ser. No. 453,113
Int. Cl.[2] B26D *5/08*
U.S. Cl. 83—623 **2 Claims**

1. Apparatus for cutting a strip of mat of bonded fiber comprising a blade having a cutting edge; groups of contiguous teeth separated by notches on said cutting edge; a base portion of each notch which is sharpened; means to reciprocate said blade toward and away from the mat while maintained transverse of the strip of mat to penetrate completely said mat with said teeth without completely penetrating said mat with the base of said notches; an anvil disposed on the opposite side of the mat from said blade and adapted to position said mat for penetration by said teeth; and means to selectively advance said anvil toward said blade in conjunction with the reciprocation of said blade whereby said base of said notches completely penetrate said mat.

3,910,146
GUIDE FOR SABER SAW

William L. Earl, 439 Church Rd., E., King of Prussia, Pa. 19406

Filed Oct. 25, 1974, Ser. No. 517,927
Int. Cl.[2] B26D *7/26, 5/00*
U.S. Cl. 83—745 **4 Claims**

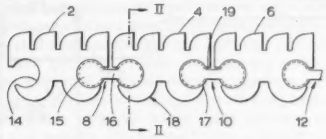


1. A guide for use with a saber saw, said guide comprising:
an elongated rectangular magnetic bar having a longitudinally extending slot disposed in one major surface;
a C clamp having a head engagable with said slot;
a pair of pointer elements, each element being elongated with a point at one end and a flat base plate at the other end, the point extending in a direction perpendicular to the plate; and
a pair of flat magnets, each magnet being disposed on and secured to the corresponding plate.

3,910,147
CHAIN SAW SWORD, A SAW CHAIN AND METHOD OF FORMING SAW CHAIN

Arthur Eugen Heyerdahl, Oslo, Norway, assignor to Elkem-Spigerverket A/S Jobu, Drobak, Norway

Filed Nov. 23, 1973, Ser. No. 418,240
Claims priority, application Norway, Nov. 29, 1972, 4388/72
Int. Cl.[2] B26D *1/46;* **B27B** *33/14*
U.S. Cl. 83—830 **4 Claims**



1. A saw chain for use in a chain saw, said saw chain comprising:

an assembly of links, said links having at the longitudinal ends thereof circular-shaped openings and complementary circular-shaped heads;

the heads of said links being pivotally and nonremovably received in the openings of adjacent of said links;

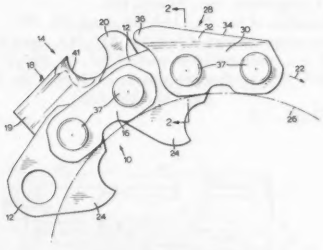
the entire peripheries of said openings and heads having, as viewed in a radial cross-section, complementary V-shaped configurations with flat opposed sliding surfaces in contact; and

said links having opposite flat lateral surfaces, the lateral surfaces of all of said links being contiguously flush with each other.

3,910,148
SAFETY SAW CHAIN

Werner Weiss, Burlington, Canada, assignor to Sabre Saw Chain (1963) Ltd., Burlington, Canada

Filed July 25, 1973, Ser. No. 382,547
Claims priority, application Canada, Aug. 17, 1972, 149610
Int. Cl.[2] B27B *33/14*
U.S. Cl. 83—833 **12 Claims**

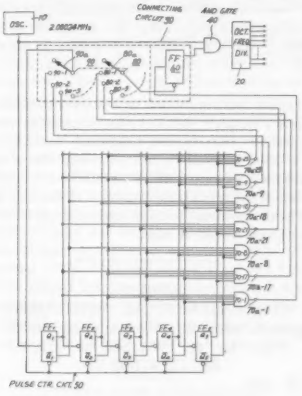


1. A safety saw chain comprising a plurality of center links and a plurality of pairs of side links pivotally joining said center links, certain of said pairs of side links being cutter pairs comprising a noncutting tie link on one side of the chain and a cutter link with an upstanding cutter portion on the opposite side of the chain; each cutter pair having associated therewith a depth gauge with a leading edge, said depth gauge being disposed ahead of the cutter portion integral with a link of the chain; wherein the pair of side links immediately preceding each cutter pair is a safety pair comprising a noncutting tie link on the same side of the chain as the following cutter link and a noncutting safety link on the opposite side of the chain from the following cutter link, each said safety link having a body portion and an upstanding cam portion having an upwardly and rearwardly sloping upper edge adapted to lift small diameter timber smoothly over the leading edge of said depth gauge; said cam portion terminating adjacent said depth gauge in a rearwardly projecting nose, said nose ending in a tip disposed in overlapping relationship laterally opposite the depth gauge when the chain is straight; the center of gravity of each safety link lying nearer to the center link following that safety link than to the center link preceding that safety link.

3,910,149
ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF TRANSPOSITION

Nobuharu Obayashi, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Oct. 11, 1973, Ser. No. 405,643
Claims priority, application Japan, Oct. 12, 1972, 47-101557
Int. Cl. G10h *1/00, 5/06*
U.S. Cl. 84—1.01 **2 Claims**



1. An electronic musical instrument comprising a high-frequency oscillator, an octave frequency divider, and adjustable means passing a selected number of pulses from said oscillator and then blocking a selected number of pulses from said oscillator; said means including a gating circuit between said oscillator and octave frequency divider and a flip-flop controlling said gating circuit; said flip-flop including set and reset terminals, said adjustable means further comprising a counter coupled to said oscillator, first and second pluralities of gates coupled to said counter, and first and second selector switches respectively coupled to said pluralities of gates, one of said switches being coupled to the reset terminal of the flip-flop, the other of said switches being coupled to said counter to reset the same, said adjustable means further including a gate coupling said counter to the set terminal of said flip-flop.

3,910,150
IMPLEMENTATION OF OCTAVE REPEAT IN A COMPUTOR ORGAN

Ralph Deutsch, Sherman Oaks, and Glen R. Griffith, Westminster, both of Calif., assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

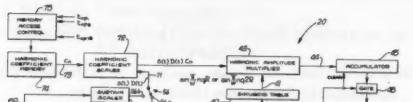
Filed Jan. 11, 1974, Ser. No. 432,683
Int. Cl.[2] G01H *1/02, 5/00*
U.S. Cl. 84—1.03 **23 Claims**

1. An electronic musical instrument comprising: tone generation means for computing in real time the amplitudes at successive sample points of a musical waveshape, said means including first circuitry for separately evaluating the constituent Fourier component, an accumulator for summing these

components to obtain each sample point amplitude, and a converter for converting the obtained amplitudes to musical tones, the fundamental frequency of the generated tone being established by a frequency number utilized by said first circuitry in each Fourier component evaluation,

note selection switches,

a frequency number memory containing frequency number values associated with selectable notes, and



octave repeat control means, operatively connected to said frequency number memory, for alternately providing to said first circuitry a first frequency number associated with a note selected by said switches and a second frequency number associated with a different note, said tone generation means correspondingly, alternately generating tones at the nominal pitch of said selected note and at the pitch of said different note.

3,910,151

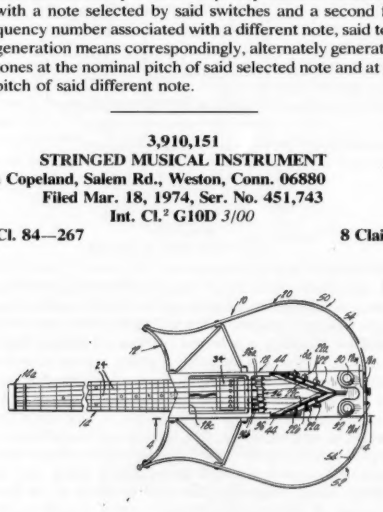
STRINGED MUSICAL INSTRUMENT

Leigh Copeland, Salem Rd., Weston, Conn. 06880

Filed Mar. 18, 1974, Ser. No. 451,743

Int. Cl.² G10D *3/00*

U.S. Cl. 84—267 **8 Claims**



1. A collapsible stringed musical instrument comprising a body including a rigid section, a neck section, means for pivotally connecting said neck section to said rigid section, a collapsible section connected to said rigid section, a tensioning device movably mounted on said rigid section, means for tuning said strings, said strings being connected between said neck section and said tensioning device, said tensioning device being movable between a first position in which said strings are under tension and a second position in which said string tension is released, said neck section being movable between a playing position when said strings are under tension and a collapsed position when said string tension is released, said collapsible section cooperating with said neck section to move between a playing position and a collapsed position to permit playing of the stringed instrument and to permit the stringed instrument to be reduced to a compact shape, respectively.

3,910,152

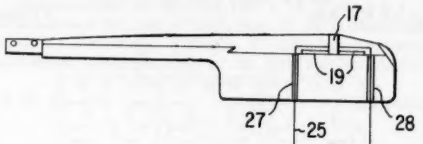
STRINGED MUSICAL INSTRUMENT HAVING AN ATTACHMENT FOR CHANGING MUSICAL KEY

Yoshinari Kusakawa, 1-34-23, Kamiikedai, Ota-ku, Tokyo, Japan

Filed May 13, 1974, Ser. No. 469,593

Int. Cl.² G10D *3/04*

U.S. Cl. 84—307 **2 Claims**



1. A stringed musical instrument comprising: a head portion, a sounding body, and an interconnecting neck portion, a set of strings extending from said head portion along said neck portion to said body, a manually adjustable bridge device slidably mounted on said sounding body and under said extending strings, said bridge device including base means for providing said adjustment hereto, said base means and said sounding body employing elongated tongue and groove bearing means engaging each other in a slidable manner and wires attached to spaced apart portions of said bridge device, each of said wires passing through a separate tubular bearing passageway in said sounding body and each terminating in a separate movable foot pedal means whereby when a foot pedal is depressed it will move the attached wire, which will in turn slide said bridge device with respect to said sounding body, whereby the player of the musical instrument can selectively change the musical key to the desired pitch of the key without interrupting his playing thereof.

3,910,153

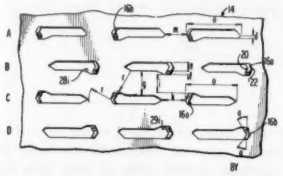
WOOD JOINT AND CONNECTOR PLATES

John Calvin Jureit, Miami, Fla., assignor to Automated Building Components, Inc., Miami, Fla.

Continuation of Ser. No. 153,169, June 15, 1971, which is a continuation-in-part of Ser. No. 815,453, April 11, 1969, which is a continuation-in-part of Ser. No. 689,017, Dec. 8, 1967. This application May 8, 1973, Ser. No. 358,400

Int. Cl.² F16B *5/07*

U.S. Cl. 85—13 **7 Claims**



1. A connector comprising a sheet metal plate having a thickness substantially no greater than 18 U.S. Standard Gauge, said plate having a plurality of slender, elongated, nail-like teeth struck therefrom and bent about axes substantially parallel to the plane containing said plate to leave a plurality of longitudinally spaced elongated slots lying generally in laterally spaced, substantially parallel rows; each of said teeth being struck to define a substantially V-shaped cross section; said teeth having base portions adjacent said plate, intermediate portions and opposite pointed end portions; each of said base portions including a lateral shoulder projecting

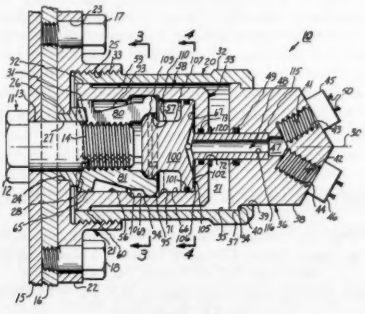
from only one side edge of the associated tooth to form an integral lateral extension thereof, the other side edge of said tooth extending in a straight line along said base and intermediate tooth portion to said pointed end portion; each of said shoulders being struck integrally with its associated tooth to leave a laterally enlarged slot formation in one side edge of the associated slot and adjacent the end of said slot from which the associated tooth projects; the edge portion of each of said slots opposite the associated tooth being pointed with the side edge of each said slot on the same side thereof as its associated enlarged slot formation extending in a straight line from said enlarged slot formation to said pointed end edge portion, the opposite side edge of said slot extending in a straight line from the associated tooth to the pointed end edge portion of said slot; the bent portions of said teeth having greater lateral extent than the width of the intermediate portions of the teeth, said bent tooth portions in one row of teeth lying in substantial lateral alignment with the metal plate portions extending between and bridging the longitudinally adjacent slots in at least a next adjacent row of teeth; each of the laterally enlarged slot formations of said one row of teeth lying in substantial lateral alignment with a corresponding plate portion in said next adjacent row of teeth extending between the juncture of the pointed end edge portion and the linearly extending side edge of an associated laterally adjacent slot and the tooth associated with the next longitudinally adjacent slot, at least a portion of each laterally enlarged slot formation lying in lateral alignment with a portion of the slot in the next adjacent row extending betwen the pointed end thereof and the juncture between the linearly extending side edge portion of such slot and its pointed end edge portion whereby the net reduction of sheet metal in said plate at aany one transversely extending cross section through the plate due to the formation of said slots is no greater than the sum of the cross-sectional areas of the slot portions from which said intermediate tooth portions are struck, said teeth being struck to comprise at least four parallel rows, the teeth forming the outermost pair of rows being longer in length than the length of the teeth forming the innermost pair of rows, the laterally enlarged slot formations of said one row of teeth lying on the side of slot formations nearest the slot formations of the next adjacent row of teeth, the laterally enlarged slot formations of said next adjacent row of teeth lying on the side thereof nearest the slot formations of said one row of teeth.

3,910,154

SEPARATION NUT

Ronald E. Gardner, Lomita, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed May 2, 1973, Ser. No. 356,287
Int. Cl. F16b *37/00*
U.S. Cl. 85—33 **18 Claims**



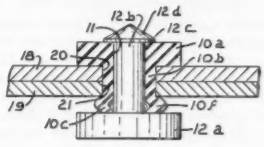
1. A separation nut for releasably engaging a threaded element, said separation nut having an engagement axis and comprising: a housing forming an internal cavity and an aperture entering the cavity to receive the element to be engaged by the separation nut; a seat member on the housing facing into the cavity and tapering inwardly as it extends into the cavity; antirotation means fixed relative to the housing; a plurality of individually disconnected nut segments in grouped configuration around the engagement axis to form a segmented nut, each nut segment including a concave surface facing the engagement axis, a thread fragment on the concave surface, which fragment is part of the same thread as is formed on the other segments, a lock surface, a relief surface, a cam surface, and a brace surface, all facing away from the engagement axis; an abutment surface facing the seat member, and a fulcrum surface axially spaced from the abutment surface, the nut segments engaging the anti-rotation means, whereby to be held against rotation around the engagement axis; a lock plunger axially movable in said cavity, a bounding wall in said lock plunger which bounds an opening that receives the nut segments in their grouped configuration, a lock surface, a drive cylinder, a drive face, a cam surface, and a brace surface, all on said bounding wall, the lock surface being so disposed and arranged as to embrace the lock surfaces of the nut segments in an engagement condition of the separation nut, at which condition the brace surfaces abut each other and the abutment surface bears against the seat member; a drive piston making an axially sliding fit in said drive cylinder and having a drive face facing toward the drive face of the lock plunger, whereby to form a power chamber in the drive cylinder, and a fulcrum surface so disposed and arranged as to bear against the fulcrum faces of the nut segments and disposed radially inwardly of the cam surfaces; and conduit means to convey fluid under pressure to said power chamber whereby to move the lock plunger axially to an unengaged position wherein its lock surface does not embrace the lock surfaces of the nut segments and does overlay the relief surfaces, wherein the cam faces engage one another to rotate the nut segments around the fulcrum surfaces as a consequence of a torque couple exerted at the cam surfaces and on the fulcrum surfaces, and the thread fragments move arcuately away from the engagement axis to release the element which was engaged by the previously-grouped nut segments, while the nut segments are retained in the housing by the drive piston.

3,910,155

JAM TOGETHER FASTENER

Leroy Wilson, P.O. Box 203, Manhattan, Kans. 66502

Filed Oct. 24, 1973, Ser. No. 409,184
Int. Cl.² F16B *19/00*
U.S. Cl. 85—70 **3 Claims**



1. An assembly for fastening apertured parts together in abutting relation, said apertured parts having a uniformly alignable circular hole therethrough, said assembly comprising:

a resilient female member containing a longitudinal bore therethrough and including a head of larger size than said hole of the apertured parts, a cylindrical sleeve being substantially equal in diameter and length to the respective diameter and length of said circular hole of the apertured parts, and a deformable terminal flange of greater size than said sleeve and integrally joined thereto and including a bore portion formed as a protuberant recess; and

a rigid male member including a head of larger size than said hole of the apertured parts and a shank joined to said head being shorter in length than said female member and

substantially equal to the size of said longitudinal bore of the female member, said shank terminating opposite said male head in an end portion greater in size than said female bore, smaller in size than said hole of the apertured parts, and substantially symmetrical about the axis of said male shank;

whereby said terminal flange and sleeve of the female member may be inserted through said hole with the head of the female member engaging one of said apertured parts and the terminal flange engaging the other of said apertured parts, with said sleeve disposed within the hole therethrough, and said end portion and shank of the male member may be forced through said bore of the female member for said female head to grippingly hold said male end portion, while compressive force of the male head causes said female terminal flange to buckle radially outwardly forming a bulge to firmly secure said apertured parts together in abutting relation between said bulge and said female head with said female member insulating said male member from contact with said apertured parts.

3,910,156

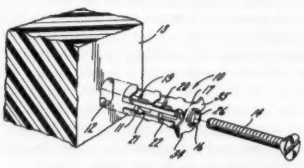
SCREW ANCHOR CLIP

Edmund John Soltysik, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,684

Int. Cl.[2] F16B *13/12*

U.S. Cl. 85—85 **1 Claim**



1. A screw anchor clip for use in a double D-shaped bore comprising a sheet metal stamping punched and formed to provide a continuous head portion, said head including a central aperture and a pair of oppositely extending tabs for overlying the peripheral margin of an aperture in the body of material having the bore adapted to receive said screw anchor clip, an upstanding annular collar formed about said aperture and having an internal diameter greater than a screw to be accepted therethrough, a pair of C-shaped spaced apart wall portions integrally connected from said head and each depending in quatrature to said tabs, said C-shaped wall portions having a configuration in cross section substantially identical to said double D-shaped bore and acceptable therein in close tolerance configuration, the ends of each C-shaped wall being spaced from and in opposition to the free ends of the other C-shaped wall, at least two pairs of diametrically opposed thread engaging members formed from struck-out portions of said C-shaped spaced apart wall portions, each of said thread engaging portions having an axially disposed portion leading into an inwardly directed angularly disposed portion having a thread engaging terminating end and said angularly disposed portions being resilient to pressures of screw threads directed from said head end portion, whereby rapid initial insertion of screw is obtained by axial telescopic insertion of said screw into said screw anchor clip until the head of said screw comes into supportive contact with said flange encircling the aperture and final tightening and removal of the screw is accomplished by thread action between said screw and said thread engaging portions, at least one free edge of said C-shaped walls having barb means struck outwardly therefrom and facing said head, said barb means being resiliently distortable and engageable for initial retention of the clip in said bore, prior to insertion of said screw, each of said C-shaped walls at the end opposite the head being continuous to provide hoop strength to said wall.

3,910,157

WHEELED CARRIAGE FOR ARTILLERY

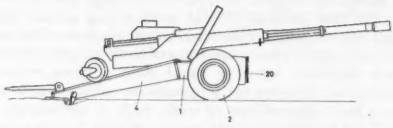
Stig Arthur Johnsson, and Arne Emil Berglund, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Dec. 21, 1973, Ser. No. 427,188

Claims priority, application Sweden, Jan. 17, 1973, 73006009

Int. Cl.[2] F41F *23/22*

U.S. Cl. 89—40 R **6 Claims**



1. An artillery piece comprising a gun supported on a carriage having a pair of main supporting wheels mounted for rotation about a common axis, a pair of elongated carriage trails extending rearwardly of said carriage and having their forward ends pivotally connected to said carriage for pivotal movement about a pair of elongated substantially vertically oriented bearing pins located on said carriage at fixed positions rearward of said pair of main supporting wheels respectively, a pair of auxiliary supporting wheels mounted on said pair of carriage trails respectively at positions rearward of said bearing pins, means for selectively displacing each of said auxiliary supported wheels between a lowered ground-engaging position below its associated carriage trail and an elevated ground-disengaged position thereby to permit the carriage trails to be selectively moved between a transport position, wherein the rearward ends of the carriage trails are located in close proximity to one another with said auxiliary supporting wheels being in their lowered ground-engaging positions for cooperation with said main supporting wheels during transport of said artillery piece, and a firing position wherein the rearward ends of said carriage trails are relatively widely separated from one another and said auxiliary supporting wheels are in their elevated ground-disengaged position so that the rearward ends of said carriage trails are in direct engagement with the ground, said elongated bearing pins both being located in a first vertical plane which is disposed behind and substantially parallel to the axis of rotation of said main supporting wheels, and said elongated bearing pins being inclined obliquely outwards respectively in relation to a second vertical plane located between said pins and extending orthogonal to said first vertical plane whereby each carriage trail moves in a generally horizontal, downwardly sloping plane relative to the ground as said carriage trail is displaced from its transport position to its firing position, the angles of inclination of said pair of bearing pins relative to said second vertical plane being so chosen that said carriage has the same generally horizontal inclination when said carriage trails are in said firing position and when said carriage trails are in said transport position.

3,910,158

METHOD OF AND APPARATUS FOR CUTTING CIRCULAR VARIABLE PITCH GEAR

Kenji Yagi, and Susumu Kidokoro, both of Fuji, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Apr. 11, 1974, Ser. No. 460,162

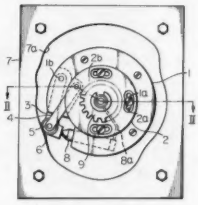
Claims priority, application Japan, Apr. 14, 1973, 48-41827

Int. Cl.[2] B23F *3/00*

U.S. Cl. 90—2 **1 Claim**

1. In apparatus for cutting a circular gear from a gear blank, the apparatus having a cutter which is rotatable about a first axis at a constant speed and movable axially to engagement

with the gear blank, a device for supporting and rotating said gear blank at a variable angular velocity thereby to cut a circular variable gear, the device comprising: a first table rotatable about a second axis vertical thereto at a constant speed; a second table resting coaxially on said first table such that said second table is rotatable relatively to said first table; means to hold said gear blank coaxially on said second table; a stationary cam member having a non-circular inner cam profile, said cam profile surrounding and being spaced laterally from said first and second tables; a first link supported at one end thereof on said first table; a second link supported at one end thereof on said second table; said first and second links being joined pivotally with each other at the other ends thereof by a movable shaft; a roller mounted rotatably on said shaft; a fluid pressure-operated piston disposed between said first table and said first link so that said roller is always urged to follow said cam profile by said piston during rotational movements of said first and second tables; and means to rotate said first table at a constant speed.



3,910,159

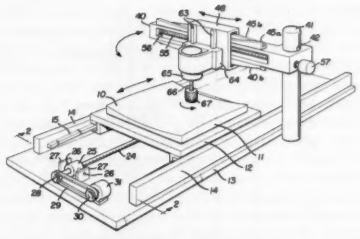
APPARATUS FOR FORMING LARGE RADIUS, COMPOUND CURVED SURFACES UPON LARGE PLATE-LIKE WORKPIECES

Floyd R. Gladwin, P.O. Box 1113, Southgate, Mich. 48192

Filed Feb. 15, 1974, Ser. No. 442,804

Int. Cl.² B23C *1/06*

U.S. Cl. 90—15 A **6 Claims**



1. An apparatus for forming large radius, compound curves upon a surface of a large, plate-like workpiece, comprising:

an elongated, horizontal supported bed with a horizontally arranged table mounted upon the upper surface of the bed for horizontal reciprocal movement along the length of the bed, with the top surface of the table forming a workpiece support for holding a large, horizontally arranged plate-like workpiece;

interengaged, cooperating guide means formed on the table and bed for guiding the reciprocal movement of the table along the length of the bed, with said guide means being curved along a large radius arc arranged in a vertical plane wherein the longitudinal reciprocal movement of the table relative to the length of the bed is along an arcuate, horizontally axised, path of a predetermined arcuate radius;

a cross member secured at a spaced distance above the bed and between the opposite ends thereof and extending transversely of the bed and over the table transversely to the direction of reciprocation of the table;

a slide member mounted upon the cross member for movement along the length of the cross member and interengaged, cooperating guide means formed on the slide member and cross member for guiding the slide member along the length of the cross member, with said guide means being curved along a large radius arc located in a vertical plane which is transverse to the plane of the arc of the table guide means, wherein the slide member may be moved back and forth along the cross or member and above the top surface of the reciprocating table in an arcuately, generally horizontally axised, curved path extending transversely of the bed, said guide means including a first track mounted upon and extending along the length of the cross member, with the upper surface of the track being curved to a predetermined arcuate curvature; and track engaging means formed on the slide member for engaging with the track upper surface for supporting the slide member upon the track, said track engaging means having a large radius curved surface for face to face guiding engagement with the upper surface of the track wherein the slide member moves in its curved path along the track; and said track being removable and replaceable by a corresponding track of different curvature for thereby varying the path of movement of the slide member;

tool means mounted upon and depending beneath the slide member for movement with the slide member and for operating upon the upper surface of the workpiece as it reciprocates upon the table beneath the cross member, whereby the tool forms the upper surface of the workpiece into large compound curves.

3,910,160

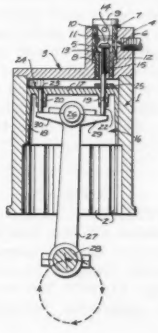
UNIFLOW STEAM ENGINE

William J. Divine, 2774 E. Walnut St., Pasadena, Calif. 91107

Filed Nov. 1, 1974, Ser. No. 520,005

Int. Cl.² F01L *21/02, 15/16*

U.S. Cl. 91—224 **8 Claims**



1. A uniflow steam engine, comprising:

a. a cylinder having a head at one end;

b. a piston reciprocable therein;

c. a steam inlet valve in the cylinder head having an end exposed to the piston;

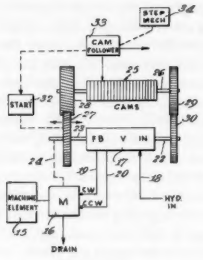
d. a connecting pin axially slidable in the piston;

e. and a connecting rod and crank shaft drive therefor for reciprocating the piston, the connecting rod including a laterally extending arm engageable with the connecting pin for causing the connecting pin to engage and open the inlet valve during a portion of the movement of the piston from the cylinder head.

3,910,161
CAM PROGRAMMED CONTROL

George F. Beckwell, Sugar Grove, Ill., assignor to Teledyne Pines, Aurora, Ill.

Filed Aug. 20, 1973, Ser. No. 390,160
Int. Cl.[2] F15B 9/10
U.S. Cl. 91—375 R 26 Claims



1. A cam programmed control for a motor moving a machine element to a predetermined position, comprising:

means for controlling the delivery of power from a power source to said motor, said power control means having first and second rotatable control shafts, the delivery of power from said source to said motor being a function of the angular offset between said shafts;

a rotatable cam shaft;

a position control cam on said cam shaft;

means connecting said motor and machine element with said first control shaft;

means connecting said cam shaft with said first and second control shafts for transmitting motion from said motor, machine element and first control shaft to said cam shaft and said second control shaft;

start means for moving one control shaft with respect to the other control shaft to establish an offset therebetween whereby the power delivery control means delivers power from said source to said motor and the motor drives the machine element, the first control shaft, the cam shaft and the second control shaft therewith, maintaining the offset between the control shafts; and

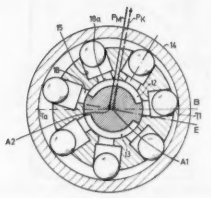
a cam follower associated with said cam and engaging the cam to stop said cam shaft and said second control shaft at a predetermined position, said motor continuing to drive said machine element and turn said first control shaft to reduce the angle of offset between said first and second control shafts to zero.

3,910,162
FORCE COMPENSATING ARRANGEMENT FOR A RADIAL PISTON MACHINE

Gerhard Nonnenmacher, Korntal, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Apr. 23, 1973, Ser. No. 353,625
Claims priority, application Germany, Apr. 22, 1972, 2219881
Int. Cl.[2] F01B 13/06
U.S. Cl. 91—498 1 Claim

1. Force compensating arrangement for a radial piston machine, comprising a control pintle having an outer cylindrical surface formed with diametrically disposed circumferentially extending high pressure and low pressure control ports; a rotor having an inner cylindrical surface mounted on said outer cylindrical surface for rotation about a first axis, said rotor including equally angularly spaced cylinders having radial cylinder axes intersecting said first axis and cylinder ports on said inner cylindrical surface communicating with said control ports, and pistons in said cylinders; and an actuator ring surrounding said rotor and having an inner cylindrical actuator surface in sliding contact with said pistons and having a second axis, said first and said second axes being parallel and located in a first axial plane so that said rotor has in said first plane inner and outer dead center points closest to, and farthest from, respectively, said actuator surface whereby a resultant of inwardly directed forces passes through said second axis defining a predetermined angle less than 90° with said first plane in the region of said inner dead center point, said high pressure and low pressure control ports being symmetrical to

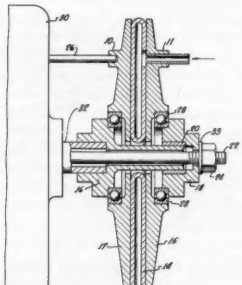


a second plane passing through said first axis and defining such an angle with said first plane so that the resultant of the outward directed pressure forces passing through said first axis is substantially parallel and equal to said resultant of said inward directed pressure forces for compensating the same, said cylinder ports being circumferentially displaced relative to said radial cylinder axes, respectively, an angle which is substantially equal to said angle between said first and second planes.

3,910,163
PNEUMATIC ACTUATOR FOR TAPE REEL HUB

Robert Ralph Elliott, Santa Ana, Calif., assignor to Century Data Systems, Inc., Anaheim, Calif.

Filed Apr. 24, 1972, Ser. No. 246,756
Int. Cl.[2] F01B 19/00; F16J 3/00
U.S. Cl. 92—92 2 Claims



1. In a tape transport having a reel motor located on one side of a partition and a latching mechanism for engaging a tape reel on the other side of the partition wherein the improvement comprises:

a hollow reel motor shaft;

means for mounting the reel motor so that said hollow shaft is perpendicular to the plane of the partition;

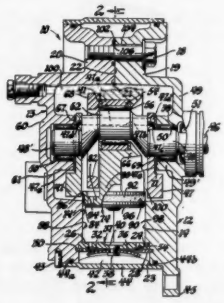
a second shaft inside said hollow reel motor shaft;

pneumatic means for moving said second shaft parallel to the axis of said reel motor shaft.

3,910,164
SPLIT CYLINDER RADIAL-FOUR AUTOMOTIVE AIR CONDITIONING COMPRESSOR

Robert L. Swadner, and Marvin E. Gaines, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 28, 1974, Ser. No. 455,674
Int. Cl.[2] F01B *29/00;* **F04B** *27/04*
U.S. Cl. 92—128 **3 Claims**



2. An improved method of assembling a radial compressor of the type including a cast aluminum two part cylinder housing having counterbored cross bores including cylinder walls therein along axes normal to each other, said housing being substantially bi-laterally symmetrical along a common transverse plane diametrical to said cross bores, said housing constituted by two separable front and rear shell-like half sections secured together along said transverse plane, said transverse plane defining semi-cylindrical cross recesses in each said front and rear half section respectively comprising the steps of supporting said rear half section horizontally with its concentric closed head portion down, inserting the rear end bearing portion of a unitized drive shaft assembly and its assoicated journal bearings into a cup-shaped hub on the inner face of said rear head, said drive shaft assembly including a pair of piston assemblies, each said piston assembly including a yoke having a pair of diametrically opposed integral pistons extending therefrom, each piston formed with relatively short skirt having an annular groove therein extending a major portion of the width along the skirt, a single Teflon sealing ring disposed in each groove to provide a relatively wide bearing surface between the skirts and their associated cross recess such that each Teflon seal portion is supported in contact with its respective rear half section cross recess, placing said front half section on said rear half section with said front concentric apertured head portion facing up whereby said drive shaft assembly front end extends through said aperture, said front half section having its four semi-cylindrical cross recesses supported in contact with the upper half of the four Teflon seals whereby the cross recesses of said upper and lower half sections are precisely aligned to form said cross bores, securing the front and rear aligned half sections by connecting bolts, placing a valve plate assembly in sealed relationship in each said counterbore radially outboard of each piston, respectively, and pressing a sleeve into surrounding relationship with said cylinder housing outboard of said plate valve assemblies to form a discharge chamber around said cylinder housing.

3,910,165
EXTENDED GUIDE-TIE RODS

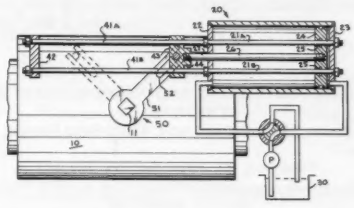
John M. Sheesley, P.O. Box 14604, Houston, Tex. 77021; Ronald A. Gulick, 218 Oyster Creek Dr., Sugarland, Tex. 77478

Filed Nov. 20, 1972, Ser. No. 308,263
Int. Cl. F16j *15/18;* **F16c** *17/00*
U.S. Cl. 92—165 R **4 Claims**

1. In an actuator having a power driven piston reciprocatingly positioned within a cylinder, and a piston rod linked at one end to said piston with said piston rod's other end extending outside of said cylinder, the improvement comprising:

spaced guide rods within said cylinder, and fixed to said cylinder at opposite ends thereof, said piston slidably engaging said guide rods;

a follower device connected to said other end of said piston rod for movement therewith exterior of said cylinder;



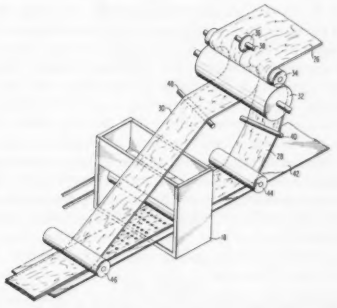
at least one follower guide means, exterior of said cylinder and fixed thereto, said follower guide means being a linear extension of at least one of said spaced guide rods; said follower device including means for slidably engaging said follower guide means; and

means associated with said follower device for actuating a further piece of equipment on said follower being caused to move by said piston rod.

3,910,166
METHOD AND APPARATUS FOR THE MANUFACTURE OF FILTER RODS CONTAINING PARTICULATE MATERIAL FROM A SPLIT WEB OF FILTER MATERIAL

John H. Sexstone, Louisville, Ky., assignor to Brown and Williamson Tobacco Corporation, Louisville, Ky.

Filed Feb. 4, 1974, Ser. No. 439,524
Int. Cl.[2] A24C *5/50*
U.S. Cl. 93—1 C **19 Claims**



1. A method of manufacturing tobacco filters comprising the steps of:

a. providing a web of filter material, said web having an elongated axis and being continuous in the direction of said axis;

b. tensioning the web;

c. spreading said web in a direction normal to said axis to a predetermined width;

d. cutting the web along a line parallel to said axis to provide first and second sections, each of said sections having an elongated axis;

e. feeding said first section of the web in a first axial direction in a flattened condition to a deposition position;

f. delivering amounts of loose particulate material to the first section of the web at said deposition position in rows

extending across said first section, said rows being spaced axially thereof;

g. feeding said second section of said web in a second axial direction to bypass the deposition position and direct the second web section into overlying relation to the deposited particulate material and said first web section whereby said material is positioned at spaced intervals between said first and second sections;

h. forming said first and second sections of said web and said particulate material into a cylindrical filter rod.

3,910,167

MACHINE FOR PLACING AND WELDING HANDLES ON PLASTIC BAGS

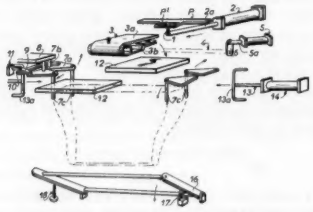
Roger Simon, 25 rue Pointe Cadet, 42000 Saint Etienne, Loire, France

Filed Sept. 27, 1973, Ser. No. 401,432

Claims priority, application France, Oct. 4, 1972, 72.35887

Int. Cl.[2] B31B *1/86*

U.S. Cl. 93—8 WA **11 Claims**



1. A machine for placing and welding handles on plastic bags, comprising a pushing mechanism for pushing individual handles horizontally with their uppermost edge forward, a pivotal gripper positioned to receive each handle, means for pivoting said gripper about a horizontal axis downwardly with the handle therewithin so that the handle depends downwardly from the gripper, displaceable welding electrodes spaced horizontally from one another and positioned beneath the gripper to receive the handle therebetween, means including an opening mechanism for receiving a plastic bag and for opening the mouth thereof at a level between the welding electrodes, the horizontal pivoting axis of the gripper being above the opening mechanism and directly above the open mouth of the bag in said opening mechanism such that the lower edge of the depending handle will be embraced by the open mouth of the bag and means for moving the electrodes horizontally towards one another to clamp the handle between the uppermost edges of the bag to effect welding of said edges to the handles.

3,910,168

METHOD OF MANUFACTURING A SET-UP BOX

Willem L. Verreydt, Kontich, and Gaston Alfons Van den Enden, Boechout, both of Belgium, assignors to Agfa-Gevaert, a naamloze vennootschap, Mortsel, Belgium

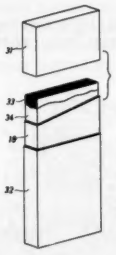
Filed Nov. 6, 1973, Ser. No. 413,349

Claims priority, application United Kingdom, Nov. 7, 1972, 51350/72

Int. Cl.[2] B31B *7/14*

U.S. Cl. 93—36.01 **6 Claims**

1. A method of manufacturing a set-up box of the type having a base and a separate lid, and a sleeve fixed into the base, comprising the steps of forming two separate tray-like constructions by cutting two flat sheets of paperboard to the required size, scoring the sheets along lines spaced internally of and parallel to the side edges thereof, and bending the marginal portions along said score lines to upstanding position, assembling the resultant tray-like constructions in face to face telescoping relationship, one within the other, fastening the overlapping tray sides together to form a closed box, covering the box thus formed with cover sheet material, cutting the box thus covered from one side to an opposite side along a plane normal to the unbent sections of the starting sheets, and fixing a sleeve into one box portion so that it projects therefrom.



3,910,169

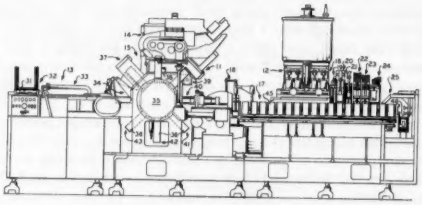
COATED MANDREL FOR CARTON FORMING MACHINE

Leslie O. Coburn, and Silvio T. Farfaglia, both of Fulton, N.Y., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 7, 1973, Ser. No. 395,028

Int. Cl.[2] B31B *3/02, 17/26*

U.S. Cl. 93—39.2 **7 Claims**



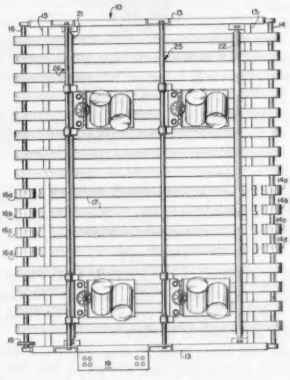
1. In a machine for forming a tubular container wherein a sidewall blank is wrapped around a mandrel with the opposite side edges overlapping and the overlapping portions are bonded to form a convolute, and a bottom closure is formed on one end of said convolute, comprising a turret, a plurality of said mandrels positioned therein, and means for rotating said turret to move each of said mandrels sequentially through a sidewall blank receiving station, a sidewall blank folding and bonding station, a bottom closure forming station, and a stripping station for the removal of the thus formed container from the respective mandrel; the improvement comprising each of said mandrels having a hollow mandrel body formed of aluminum with the blank contacting surface of said mandrel body being coated with a coating composition containing a normally solid poly(arylene sulfide), thereby reducing the frictional resistance between each mandrel and the respective convolute and reducing the weight of each mandrel, permitting the attainment of a higher production rate for the machine, and each of said mandrels having an end cap formed for steel and positioned on one end of the mandrel to serve as an anvil in the formation of the bottom closure.

3,910,170

V-NOTCHING MACHINE FOR CORRUGATED BOARD

Charles E. Boy, Cambridge, Md., assignor to Connelly Containers, Inc., Bala-Cynwyd, Pa.

Filed May 9, 1974, Ser. No. 468,317
Int. Cl.[2] B31B *1/22*
U.S. Cl. 93—58.4 **16 Claims**



1. Apparatus for cutting V-notches in corrugated board comprising:

a. means for conveying planar corrugated board along a horizontal path,

b. a support above said conveying means,

c. cutter means comprising:

i. a pair of rotary cutters,

ii. a pair of shaft means for supporting and rotating said cutters in planes at substantially 90° to each other,

iii. motor means for driving said shaft means, and

d. means carried by said support and supporting said cutter means comprising a pair of planar support elements independent of said motor means at substantially 90° to each other and at 45° to the horizontal, and each having a said shaft means extending therethrough, said planar support elements supporting said motor means.

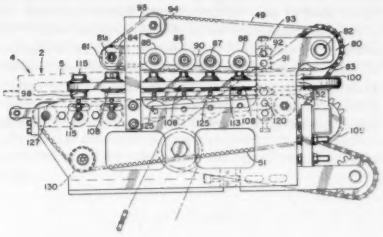
3,910,171

POLYGONAL SHAPED CONTAINER BODY FORMING APPARATUS

George Reinhardt, Hickory Hills; Mihailo Djordjevic, Dolton, and Joseph Breen, Alsip, all of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Mar. 14, 1974, Ser. No. 450,969
Int. Cl.[2] B31F *1/00;* **B31B** *1/38*
U.S. Cl. 93—82 **10 Claims**

1. A container body forming apparatus for reshaping a tubular container body of generally circular cross-section into a polygonal cross-section comprising a shaping horn having inlet and discharge ends and a plurality of sides, adjacent sides defining corners, moving surface means on each side of the horn for engagement with the interior of the container body, means providing continuous moving faces in substantially radial alignment with respective surface means for engaging the exterior of the container and clasping the same with the surface means, and means mounting said surface means on the horn recessed into respective sides in planes progressively receding into the horn and converging toward said discharge end, and said faces disposed in planes converging from said inlet end toward said discharge end and operative to deflect said container body inwardly of the sides of said horn and to continuously hold the same in said deflected condition wrapped about said corners and to commitantly advance said



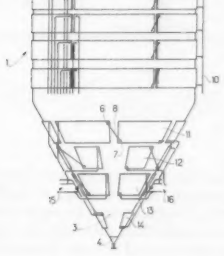
body toward said discharge end, and means providing moving surfaces at said corners for carrying the container body.

3,910,172

TANKS

Yves Germain Jaegle, Strasbourg, France, assignor to Brasseries Kronenbourg S.A., France

Filed Jan. 18, 1973, Ser. No. 324,851
Int. Cl.[2] C12C *7/14, 9/06*
U.S. Cl. 99—276 **16 Claims**



1. A jacketed tank comprising a cylindrical upper portion, a conical lower portion the apex of which is inverted and a dome closing the top of said upper portion, means associated with lateral surfaces of said cylindrical portion and of said conical portion for controlling the temperature of liquid in said tank, said temperature controlling means comprising fluid passageways disposed respectively in separate horizontal annular bands around said cylindrical portion and said conical portion, said separate horizontal bands being disposed one above another, means for supplying temperature controlling fluid to said passageways and means for selectively connecting the passageways of each band individually to said supply means to provide for separately controlling the temperature of each of said bands and thereby providing a selected vertical temperature gradient in the liquid in said tank.

3,910,173

WINE GRAPE PROCESSING APPARATUS

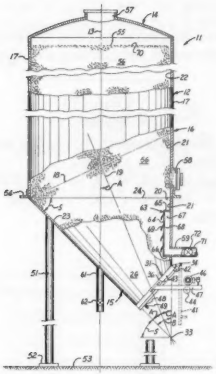
Gino R. Zepponi, Citrus Heights, Calif., assignor to Winery Systems, Inc., Folsom, Calif.

Filed June 3, 1974, Ser. No. 475,396
Int. Cl.[2] C12G *1/02*
U.S. Cl. 99—277.1 **11 Claims**

1. A juice processing apparatus comprising:

a. a tank having vertical side walls encompassing the material to be processed, the material including a juice fraction and a non-juice fraction;

b. a downwardly converging bottom closure mounted on the lower end of said tank with one element of said bottom closure substantially vertical and co-linear with a vertical element of said tank, the opposite element of said bottom closure being inclined at least at the respose angle of the non-juice fraction to enable the same to slide toward the lower convergent portion of said bottom closure, said lower convergent portion having an opening therein;



c. a door hingeably mounted on said bottom closure to cover and uncover said opening, at least the nonjuice fraction being dischargeable through said opening by gravity alone as said door uncovers said opening;

d. Means connected to said bottom closure for draining the juice fraction separated from the non-juice fraction and accumulated in said bottom closure;

e. means mounted on said tank adjacent the upper end thereof for sprinkling the contents; and,

f. means associated with said draining means and leading to said sprinkling means for reintroducing the juice fraction accumulated in said bottom closure into said upper end of said tank.

3,910,174
PIT BRINING

Jakob Nelles, Maquoketa, Iowa, assignor to Jakob Nelles, Maquoketa, Iowa

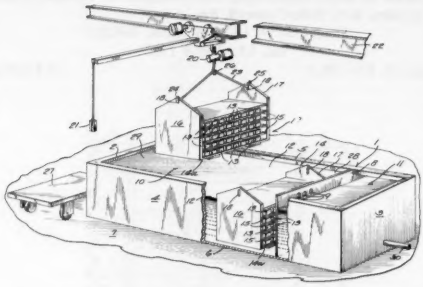
Filed Jan. 10, 1973, Ser. No. 433,018
Int. Cl.[2] A01J *25/16*
U.S. Cl. 99—452 **6 Claims**

3. A brining apparatus for use in manufacturing cheese comprising the combination of

a brining pit to hold a brine solution and being open at the top for the reception and removal of cheese;

a brine circulation system including a cooler to circulate said brine in said brining pit and to maintain a substantially uniform predetermined temperature range throughout said brine solution in said brining pit;

and a submersion rack having a plurality of shelves for holding cheese to be brined and being of sufficient weight to sink to the bottom of said brining pit when fully loaded

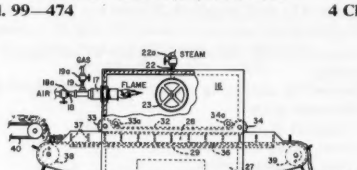


with cheese so as to completely immerse said cheese in said brine.

3,910,175
DRY BLANCHING APPARATUS AND PROCESS

Traver J. Smith, San Jose, Calif., assignor to Genevieve I. Hanscom; Robert Magnuson and Lois J. Thomson, all of San Jose, Calif., part interest to each

Division of Ser. No. 174,903, Aug. 25, 1971, Pat. No. 3,801,715. This application Jan. 17, 1974, Ser. No. 433,994
Int. Cl.[2] A23B *7/06;* **A23L** *3/16*
U.S. Cl. 99—474 **4 Claims**



1. In an apparatus for the dry blanching of vegetables, a combustion chamber, means forming a continuous substantially closed path including said combustion chamber for recirculation of a gaseous treating medium, a burner at said combustion chamber, conduit means for introducing air and fuel into the burner, means for introducing moisture into said path to mix into said medium, a plenum chamber formed at a lower part of said closed path, and a treating zone in said closed path immediately above said plenum chamber.

3,910,176
APPARATUS FOR STERILIZING MEAT PRODUCTS AND METHOD OF USING SAME

Sherman D. Burrows, 1737 Catalina Ave., Seal Beach, Calif. 90740

Filed Oct. 19, 1973, Ser. No. 407,828
Int. Cl.[2] A23L *3/32*
U.S. Cl. 99—477 **5 Claims**

1. An apparatus for sterilizing microorganism infected meat products that includes:

a. an elongate having first and second ends and a bottom, with said tank capable of containing a liquid aqueous medium therein;

b. first and second rotatably supported rollers adjacent said first and second ends of said tank;

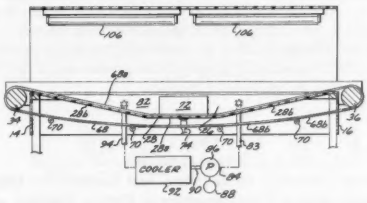
c. an endless flexible belt of a non-electrical conducting material rotatably supported from said first and second rollers, said belt including an upper reach, said belt of such length and such weight that said upper reach is disposed below the surface of said liquid aqueous medium in said tank, said upper reach serving to support said meat

products deposited thereon adjacent said first end of said tank;

d. two laterally spaced electrodes disposed in said tank intermediate said first and second ends thereof, with said electrodes of substantial length and said electrodes disposed on opposite sides of said belt;

e. first means for supporting said electrodes in a fixed relationship with said tank and in electrically insulated relationship with one another;

f. second means for driving at least one of said first and second rollers to move said belt at not greater than a first speed and in a direction in which said meat products are transported from said first end of said tank towards said second end thereof;



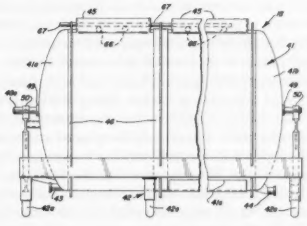
g. third means for applying electrical energy to said electrodes to establish an electrical potential zone therebetween in said aqueous medium through which said upper reach of said belt and said meat products supported thereon travel, said electrical potential zone of sufficient magnitude to render microorganisms in said meat products permanently inactive when said meat products are exposed to said electrical potential zone for greater than a first predetermined period of time, and the speed of said belt and the length of said electrodes being so selected that each of said meat products when transported on said upper reach of said belt from said first end of said tank to said second end of said tank is subjected to said electrical potential zone for greater than said first period of time and said microorganisms therein are rendered permanently inactive as a result thereof.

3,910,177

APPARATUS FOR MAKING DOUGH FOR YEAST-RAISED BAKERY PRODUCTS

Alden H. Wakeman, Lake Mills, Wis., assignor to Crepaco, Inc., Chicago, Ill.

Filed Sept. 4, 1973, Ser. No. 393,749
Int. Cl.[2] A21C *1/0*
U.S. Cl. 99—483 **9 Claims**



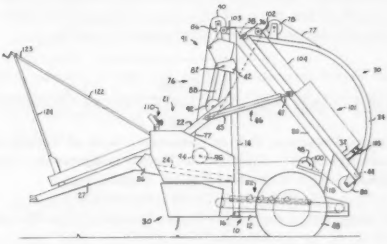
1. A fermentation apparatus for use in a process of making dough for yeast-raised bakery products, said apparatus comprising a housing provided with an elongated chamber having an annular surface and through which a fermentable mixture is adapted to pass during fermentation thereof, said chamber having a mixture- input port at one end and a mixture- output at the opposite end, means on said housing for venting a portion of the gas produced within the chamber during fermentation of the mixture, and an elongated driven means mounted within said chamber for rotation about the longitudinal axis thereof and effecting continuous inversion of the fermentable mixture; said driven means including a reel assembly having a plurality of longitudinally spaced apertured partitions and imperforate shelf members disposed intermediate and interconnecting adjacent partitions, said partitions and shelf members being rotatable as a unit and cooperating with the chamber surface to form a plurality of interconnected longitudinally arranged compartments through which the fermenting mixture is adapted to successively pass upon rotation of said reel assembly in one direction; the apertures in one partition being offset relative to the apertures in an adjacent partition.

3,910,178

APPARATUS FOR WRAPPING A ROUND BALE FORMED IN A ROUND BALE FORMING MACHINE

Edward T. Eggers, New Holland; Harry C. Eberly, Narvon; Allison W. Blanshine, Lititz, and Floyd L. Myer, New Holland, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Oct. 12, 1973, Ser. No. 405,979
Int. Cl.[2] B65B *13/18*
U.S. Cl. 100—5 **11 Claims**



1. An apparatus for wrapping a round bale formed in a round bale forming machine comprising:

a. a support mounted to the frame of the round bale forming machine,

b. means operably associated with the frame for containing a supply of wrapping material,

c. a material directing member adapted to dispense the material,

d. means for mounting the member to the support in the vicinity of the round bale,

e. means operably associated with the mounting means for moving said member whereby material is dispensed along a path in the vicinity of the round bale under conditions where said member is moving in such a way as to feed said material around said bale, and

f. means for automatically increasing, the tension of said material from one level of tension to a second level of tension, under conditions where said material is being continuously fed around said bale.

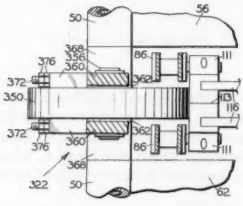
3,910,179
CONTINUOUS, LAMINATED-PLATEN PRESS FOR PRESSING GLUE-COATED PRESS CHARGES

Arthur L. Troutner, Boise, Idaho, assignor to Trus Joist Corporation, Boise, Idaho

Division of Ser. No. 320,874, Jan. 4, 1973, Pat. No. 3,878,027, which is a continuation-in-part of Ser. No. 268,674, July 3, 1972, abandoned, and a continuation-in-part of Ser. No. 78,839, Oct. 12, 1970, abandoned. This application July 11, 1974, Ser. No. 487,542

Int. Cl.[2] B30B *5/06, 15/34*

U.S. Cl. 100—154 **3 Claims**



1. In a continuous press for pressing glue-coated press charges, the combination of:

1. a pair of cooperating press belts each comprising a pair of endless support members transversely mounting a plurality of press platen assemblies,
2. each press platen assembly including a pair of terminal platen support blocks having exterior bearing surfaces, and
3. a plurality of side guide assemblies positioned along the length of the press for bearing, guiding contact with the bearing surfaces of the platen support blocks.

3,910,180
AIR FEEDER FOR AUXILIARY JOBS IN MACHINE TOOLS

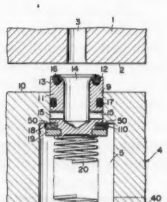
Nariyoshi Yasuhara; Fukuo Yamamoto, both of Toyota, and Yoshinori Fujii, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 7, 1974, Ser. No. 467,818

Claims priority, application Japan, May 11, 1973, 48-52798

Int. Cl. B30b *15/02*

U.S. Cl. 100—224 **2 Claims**



1. In machine tools such as a press machine provided with moving bolsters,

an air feeder in the machine tools comprising:

a header on a fixed side which is installed on a frame and which has a flat upper-end surface;

an air chamber which is defined inside the fixed side header;

a hole portion which is formed in an upper wall of said air chamber, which communicates with said air chamber and which opens to said upper end surface;

an air valve which is disposed in said hole portion in a manner to be vertically movable,

said air valve being provided with an air supply passage which extends vertically upwards and which has a bottom wall, and branch passages which intersect orthogonally with said supply passage at its lower end part,

seal members being respectively arranged on an upper end part, an outer peripheral surface and a lower-end side surface of said air valve;

a coiled spring which is interposed between a lower surface of said bottom wall of said air valve and a lower wall of said air chamber so that said air valve may be normally held at a cut-off position being non-operative position;

a header on a movable side which is installed on a moving bolster and which has a flat lower-end surface; and

an air passage which is provided vertically upwards from said lower end surface of the moving side header;

said air passage and said air chamber coming into communication only when said movable side header and said fixed side header are held in contact.

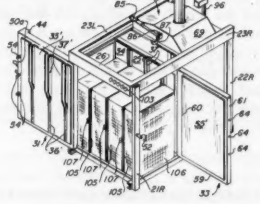
3,910,181
BALING PRESS

James S. Andrews, Westminster, and Leonard L. Hierath, Denver, both of Colo., assignors to Fremco Manufacturing, Inc., Denver, Colo.

Filed Jan. 4, 1974, Ser. No. 430,795

Int. Cl.[2] B30B *15/06;* **B65B** *13/06*

U.S. Cl. 100—226 **8 Claims**



1. A baling press for forming bales from loose material, such as cardboard, paper and the like, comprising:

a. a baling chamber formed as an open top, box-like structure having a floor, a rear wall, a front wall opposing the rear wall and left and right side walls opposing each other; b. a platen and means for moving said platen downwardly and into the chamber to compress material therein whenever the platen is positioned over the chamber;

c. means for supporting said platen and said platen moving means, said supporting means being shiftably mounted above the baling chamber for movement to an offset position to permit material to be placed in the chamber from the open top thereof and for movement to a compressing position directly over the chamber;

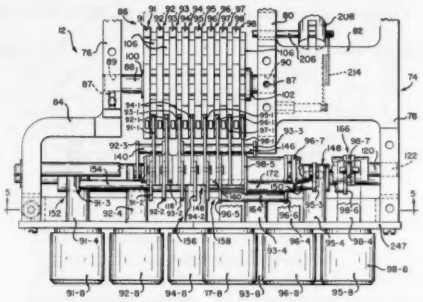
d. a vertical slot in a wall of the chamber, a corresponding vertical slot in an opposing wall of the chamber and a channel in the platen in alignment with the opposing vertical slots whenever the platen is lowered into the chamber, whereby a wire placed upon the floor of the chamber with an end extending from each vertical slot may be wrapped about a bale by placing the ends of the wire in the vertical slots and threading one end through the channel for connection with the opposite end of the wire in the slot at the opposite side of the bale; and

e. inturned lip means at each slot extending into said chamber from the wall thereof.

3,910,182
IMPRINTING MEANS FOR A COMPUTER ACCESS TERMINAL

Charles H. Wagner, and William R. Beverley, both of Kettering, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed June 6, 1974, Ser. No. 476,983
Int. Cl.[2] B41J *1/60*
U.S. Cl. 101—110 2 Claims



1. In a computer access terminal having a keyboard means for entering data into said terminal, and an imprinting means for printing data on a record medium inserted in said terminal in response to data entered on said keyboard means and an imprint signal from said terminal;

said imprinting means comprising:

a frame means for securing said imprinting means to said terminal;

a plurality of amount wheel means rotatably mounted in said frame means for representing a multi-digit number; indexing means for each amount wheel means for incrementally indexing the associated said amount wheel means one digit position relative to a print line each time the indexing means is actuated so that each amount wheel means is successively indexed a predetermined number of times to effect a predetermined number of digit positions of indexing corresponding to an associated digit entered on said keyboard means; and

actuating means for each said indexing means to actuate each said indexing means the associated said predetermined number of times upon the occurrence of said imprint signal;

said indexing means for each said amount wheel means comprising:

teeth means having a plurality of teeth on each amount wheel means;

a pawl means having first and second ends, and means for mounting said pawl means in said frame means at a point between its said first and second ends but close to said second end for pivotal movement between first and second positions relative to the associated said amount wheel means; and

a spring means;

the associated said actuating means, when energized, being effective to pivot said pawl means to said second position against the bias of the associated said spring means to enable said second end of said pawl means to enter a space between two adjacent said teeth of the associated said amount wheel means to thereby enable said second end to partially index said associated amount wheel means one digit position in an indexing direction upon said pawl means reaching said second position, and with said spring means being effective to pivot said pawl means to said first position to enable said first end to engage a next succeeding said tooth to rotate said amount wheel means in said indexing direction to complete the indexing of said amount wheel means one digit position as said pawl means is returned to said first position by the associated said spring means upon each momentary energization of the associated said actuating means;

each said amount wheel means having a lug on the periphery thereof, and a switch means cooperating with said lug to close said switch means when said lug contacts said switch means to thereby deactivate the associated said actuating means to thereby align said amount wheel means in a home position with reference to said printing line prior to indexing each said amount wheel means said predetermined number of times to effect a predetermined number of digit positions of indexing corresponding to an associated digit entered on said keyboard means;

said teeth on each said amount wheel means being arranged on a side thereof in the form of a gear and each tooth having straight sides converging in a point and with the sides of two adjacent teeth being substantially perpendicular to each other;

each said pawl means being U-shaped with said first and second ends thereof being substantially parallel to each other and with said first end being substantially parallel to and contacting one side of a tooth on the associated said amount wheel means to align the associated said amount wheel means in an aligned position with reference to said printing line;

each said amount wheel means having a plurality of digits around a portion of the periphery thereof and also having a flat portion on said periphery; said terminal having slot therein to guide a credit card over said plurality of amount wheel means; each said amount wheel means having its associated flat portion aligned with said printing line when in said home position to enable said credit card to be moved in said slot over said plurality of amount wheel means when each said amount wheel means is in said home position; and

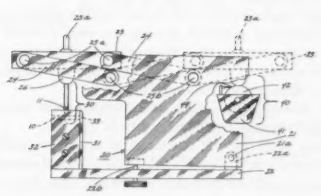
each said pawl means having a connection point located thereon between its associated first and second ends and being displaced from said point at which said pawl means is pivotally mounted;

said indexing means for each said amount wheel means including link means connecting each said pawl means at said connection point with its associated said actuating means.

3,910,183
APPARATUS FOR OFFSET PRINTING CAPSULES

Oscar B. Noren, Grosse Pointe Farms; Stephen Balog, Farmington Hills, and Carl C. Garland, Detroit, all of Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Feb. 28, 1974, Ser. No. 446,894
Int. Cl.[2] B41F *17/36*
U.S. Cl. 101—41 3 Claims



1. Apparatus for printing capsule parts comprising

a capsule mold pin bar carrying perpendicularly a row of capsule mold pins adapted for forming capsule parts by the dip molding technique,

fixture means for mounting the pin bar at a printing station, platen means carrying a row of deformable offset printing pad surfaces, the said pin row and printing surface row being mutually matched such that all of the respective pins and printing surfaces are in registry when the two

rows are brought together in printing relation, the platen means being mounted by a parallelogram linkage to reciprocate between an inking position and a printing position,

gravure means for inking said printing surfaces comprising an offset gravure roll carrying peripheral gravure recesses corresponding in number and in spacing to the printing pad surfaces such that said surfaces can be brought into one-to-one contact with the gravure recesses in the inking position, and

means for bringing said rows into registry at the printing station such that a predetermined portion of a capsule part formed on each pin can be printed.

3,910,184

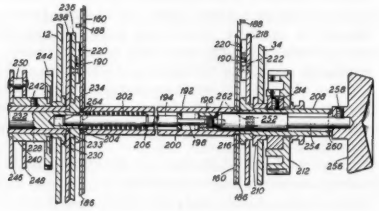
QUICK COUPLING FOR THE DRUM OF A DUPLICATING DUPLICATOR

Edward M. Springer, Chicago, Ill., assignor to Heyer Inc., Chicago, Ill.

Division of Ser. No. 186,956, Oct. 6, 1971, Pat. No. 3,835,772. This application May 13, 1974, Ser. No. 469,095

Int. Cl.[2] B41L *13/06*

U.S. Cl. 101—116 **11 Claims**



7. In a duplicating machine, means for quickly connecting and disconnecting a rotatable drum between a pair of side frames including:

a pair of supporting members at the ends of said drum journaled in said side frames for rotation with said drum about a common axis of rotation;

said supporting members having bores aligned along said axis of rotation;

an axial sleeve in said drum;

a screw-threaded bushing within said sleeve;

a first shaft, within the bore of one of said supporting members, axially shiftable between an extended position engaged within an end of said sleeve, and a retracted position disengaged from said sleeve;

a second shaft, within said sleeve, axially shiftable between an extended position having an end portion engaged within the bore in the other of said supporting members, and a retracted position disengaged from the bore in said other supporting member; and

spring means within said drum urging said second shaft toward its said retracted position;

said first shaft having a manually operable handle at its outer end portion exteriorly of said one supporting member, and a screw-threaded extension at its inner end portion;

said first shaft, when moved to its said extended position, being engageable with said second shaft to shift said second shaft to its said extended position, and being rotatable to engage the threads of said extension and bushing to hold said shafts in their respective extended positions, thereby simultaneously connecting both ends of said drum with said supporting members;

said first shaft, when moved to its said retracted position, being disengageable from said second shaft enabling said spring means to shift said second shaft to its said retracted position, thereby simultaneously disconnecting both ends of said drum from said supporting members.

3,910,185

TRANSVERSE FRAME ADJUSTMENT MEANS FOR SILK SCREEN PRINTING APPARATUS

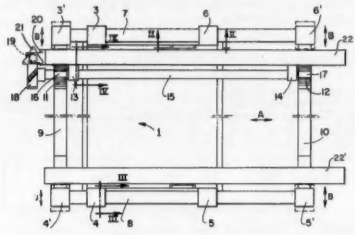
Umberto Brasa, Uguccione da Pisa, No. 6, Milan, Italy

Filed June 28, 1973, Ser. No. 374,756

Claims priority, application Italy, June 28, 1972, 26348/72

Int. Cl.[2] B41F *15/36*

U.S. Cl. 101—124 **2 Claims**



1. In a silk screen printing machine which includes a printing frame movable in a reciprocating operating direction and required to be registered transversely of said operating direction and first rack and pinion means coupled to said printing frame for effecting reciprocating longitudinal translation thereof in said operating direction; said frame being slidably mounted upon a pair of longitudinal arranged parallel first guides, each of said guides having supports at their extremities, said supports having orthogonal axes relative to the first guides, second guides comprising a pair of parallel arranged cross-pieces, each extending between and engaged with the supports at a common extremity of said first guides along said orthogonal axes respectively, said machine having a pair of arms fixed thereto and disposed inwardly of said frame and adjacent to opposite edges thereof and having an elongate shaft supported between said arms, means to rotate said shaft from a single location therealong, second rack and pinion means coupling each of said cross-pieces and said shaft at the opposite ends of said shaft to enable both cross-pieces and the printing frame to be moved in a direction transverse during operation of the frame in the operating direction to achieve said registration.

3,910,186

INK SUPPLY APPARATUS FOR INTAGLIO PRINTING PRESS

Salvatore F. D'Amato, Floral Park, and Chauncey P. Foote, Jr., Katonah, both of N.Y., assignors to American Bank Note Company, New York, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,551

Int. Cl.[2] B41F *9/06, 9/14, 31/26*

U.S. Cl. 101—156 **5 Claims**

4. An intaglio press including:

a. a plate cylinder carrying a plurality of plates of equal circumferential extent, with their circumferential ends separated by recesses of equal circumferential extent in the cylinder surface;

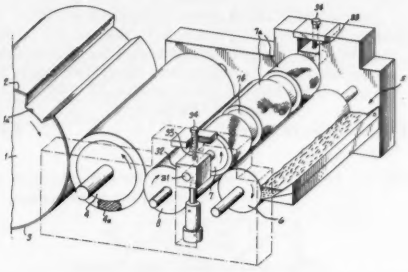
b. ink supply apparatus, including:

1. an inking roller having a compressible peripheral layer;

2. means supporting the roller for rotation in compressive engagement with the plate;

3. said roller having a circumference slightly greater than the sum of the circumferential lengths of one plate and one recess, so that the inking roller is effective to apply a heavier layer of ink to the leading margin than to other parts of the plate;

c. plate wiping apparatus, including:
1. a pressure pad;
2. means for advancing a web of fresh wiping material between the pressure pad and the plate when a recess between plate ends is passing the pad, so that fresh wiping material is first engaged by the leading margin



of the plate; said fresh wiping material being effective to remove more ink from the image areas of the leading margin than from the image areas of other parts of the plate;

d. said heavier layer of ink compensating for the excessive removal of ink from the image areas of said margin to secure uniform image density.

3,910,187

DRY PLANOGRAPHIC PRINTING PLATE

Donald Philip Cords, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 176,094, Aug. 30, 1971, abandoned. This application Aug. 22, 1973, Ser. No. 390,372

Int. Cl.² B41M *1/00*

U.S. Cl. 101—450 **28 Claims**

1. A dry planographic printing plate comprising a support with a surface having

A. a printing portion receptive to printing ink, and

B. a nonprinting portion which repels printing ink, the nonprinting portion selected from the group consisting of

i. a fluorine-containing compound having a fluorinated radical at one end, and a polar radical at the other end, and

ii. a fluorine-containing compound that is a polymer of a compound having a fluorinated radical linked to a radical having a polymerizable carbon-to-carbon linkage,

the nonprinting portion of the plate being characterized by a critical surface tension at 25°C. of up to about 15.4 dynes/cm. as determined by advancing contact angles and up to about 16.1 dynes/cm. as determined by receding contact angles,

the advancing and receding contact angles determined, respectively, by observing an expanding and contracting drop of an n-alkane test liquid on the non-printing portion of the plate.

3,910,188

ONE WATT/ONE AMP NO-FIRE MATCH TYPE INITIATOR

Philip M. Stevens, Salt Lake City, Utah, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 4, 1974, Ser. No. 457,861

Int. Cl.² F42B *3/12*

U.S. Cl. 102—28 M **2 Claims**

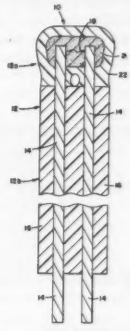
1. A match type electrical initiator comprising:

i. an insulated dual conductor flat cable having a head portion and a body portion, said conductors extending through said body portion and having first ends terminating in said head portion;

ii. insulating means covering said body portion;

iii. a bridgewire fastened between said conductors in said head portion;

iv. an ignition material covering said head portion, and ignition material being comprised of about 90% by weight of a stoichiometric mixture of lead thiocyanate about 35.6 parts, potassium chlorate about 44.4 parts, and charcoal about 20.0 parts, and of about 10% by weight of a binder material comprised of lead styphanate in ratio of



about 2 grams to about 1.2 cubic centimeters of a lacquer formulated of about 3–4 parts of dewaxed bleached shellac, of about 0.019–0.025 parts of oxalic acid, of about 9.5–10.5 parts nitrocellulose, of about 12.5–14.5 parts non-volatile solvent, and of about 84.5–87.5 parts of a mixed solvent comprised of one or more parts each of denatured ethanol, isopropyl alcohol, methylisobutyl carbinol, butyl alcohol, methyl ethyl ketone, methyl isobutyl ketone, toluol, and xylol; and,

v. an external epoxy adhesive that is curable with an amine curing agent for coating and for sealing said ignition material.

3,910,189

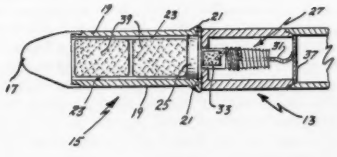
DEPLOYMENT OF CONDUCTORS INTO THE ATMOSPHERE

Roger W. Whidden, Dedham; Frank R. Leonard, Billerica; Sidney Rosenthal, West Newton, and Richard O. Fitzpatrick, Fitchburg, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 25, 1974, Ser. No. 454,199

Int. Cl.² F42B *13/28*

U.S. Cl. 102—34.4 **3 Claims**



1. Apparatus for deploying a long electrical conductor into the atmosphere from an aircraft rocket or the like comprising a pod positioned on the forward end of the rocket and holding a ball of tape, said pod including a pair of pod shells of complementary semi-cylindrical configuration hingedly attached to said aircraft rocket and a pod cap slidably attached to the forwardmost portion of said pod shells and operating to main-

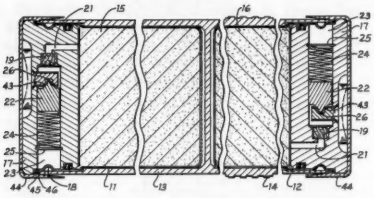
tain pod shells in closed position, a pyrotechnic pod opener positioned in said rocket immediately behind said pod, and means for opening said pod and releasing its contents after passage of a predetermined controllable time interval by activating said pyrotechnic pod opener when the motor in said rocket reaches a predetermined temperature level.

3,910,190

HAND-HELD SIGNALING DEVICE HAVING MANUAL FIRING MEANS

Sherman E. Dare, Wheatland, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 22, 1974, Ser. No. 463,077
Int. Cl.[2] F42B *4/26*
U.S. Cl. 102—37.4 **4 Claims**



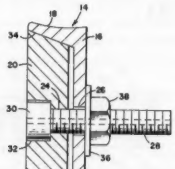
1. A signaling device comprising,
an outer container,
at least one inner container within said outer container having pyrotechnic composition therein,
an ignition housing in one end of said outer container,
a primer in said ignition housing,
a firing pin slidably mounted in said ignition housing and having a tang on one end adaptable for engaging said primer, and
a barrier plate slidably and pivotally attached to said ignition housing and engageable with the tang end of said firing pin whereby said barrier plate must be first slidably moved and then pivotally moved to release said firing pin for detonating said primer.

3,910,191

VARIABLE PRESSURE NOZZLE CLOSURE

Nathan P. Williams, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 7, 1974, Ser. No. 467,771
Int. Cl.[2] F02K *1/00*
U.S. Cl. 102—49.3 **2 Claims**



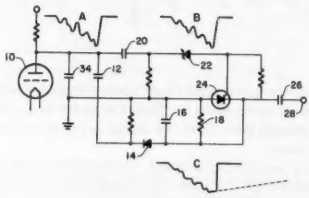
1. A variable pressure closure for use in hermatically sealing the nozzle end of a missile motor comprising: an expansion seal having an outer perpherical edge, said seal being provided with a recessed opening; a seal expander disposed in said recessed opening for engagement with said perpherial edge; a bolt having a holding nut at one end thereof; said seal and said expander being provided with central openings therethrough for passage of said bolt, and a securing nut on said bolt for variably drawing said expander into said seal recessed opening to outwardly expand said seal edge into engagement with said motor nozzle.

3,910,192

FUZE SIGNAL PROCESSING CIRCUIT

John O. Dick, Riverside, and John C. Billings, Jr., La Sierra, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 27, 1964, Ser. No. 370,740
Int. Cl.[2] F42C *13/00*
U.S. Cl. 102—70.2 P **1 Claim**



1. In a fuze processing circuit which is not influenced by a high degree of modulation present in the target envelope signal, the combination comprising:
a. a source of target envelope negative signals having a high degree of modulation,
b. a storage capacitor,
c. a diode coupling only the negative going portion and blocking the positive going portions of said target envelope signal to said storage capacitor,
d. an output terminal,
e. a normally non-conducting silicon controlled rectifier,
f. said silicon controlled rectifier being serially connected across said storage capacitor,
g. circuit means coupling the anode of said silicon controlled rectifier to said output terminal,
h. circuit means including a Zener diode coupled to said source of target envelope negative signals and to the control electrode of said normally non-conducting silicon controlled rectifier for switching said normally non-conducting silicon controlled rectifier to a conducting condition to discharge said storage capacitor in response to the termination of a target envelope negative signal.

3,910,193

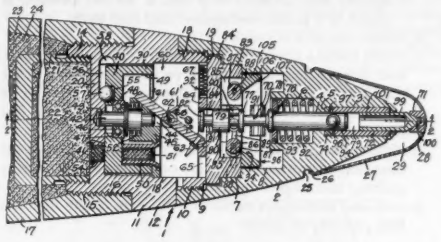
FUSE

Edwin F. Shelley, New Rochelle; Harold G. Wenig, Brooklyn, both of N.Y.; Selim S. Podnos, Washington, D.C., and Alexander Shayne, New York, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 23, 1954, Ser. No. 412,136
Int. Cl.[2] F42C *1/08*
U.S. Cl. 102—75 **16 Claims**

1. In a rotating projectile symmetrical about a longitudinal axis, a fuse having a main body portion, there being a coaxial recess formed in said body portion, a cylindrical disc rotatable in said recess about said longitudinal axis, there being oppositely disposed grooves in the abutting faces of said body portion and said disc, the groove in said disc extending first

arcuately then radially outwardly, the groove in said body extending radially outwardly, a ball received in said grooves

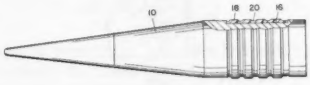


and responsive to centrifugal force to rotate said disc from safe position to armed position.

3,910,194
PROJECTILE ROTATING BAND

Henry C. Dehm, and Burton E. Tew, Jr., both of Salt Lake City, Utah, assignors to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 111,415, Feb. 1, 1971, abandoned. This application Apr. 25, 1973, Ser. No. 354,414
Int. Cl.[2] F42B *31/00*
U.S. Cl. 102—93 **2 Claims**

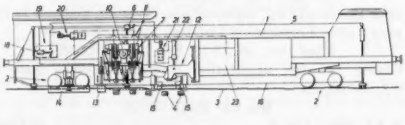


1. A metal projectile having a high density polyethylene rotating band secured to the surface of the metal projectile, the intersection of the surface of the metal projectile and the polyethylene rotating band defining an interface, said polyethylene rotating band being secured to the metal projectile solely by a chemical bond formed between the metal projectile and a primer and between the primer and polyethylene rotating band at the metal projectile-rotating band interface, said primer being prepared from a solution comprising ethylene-acrylic acid copolymer, said chemical bond having a strength such that the chemically bonded polyethylene rotating band when tested to failure in tension or in shear fails in the polyethylene rotating band rather than at the metal projectile-rotating band interface.

3,910,195
TRACK TAMPER AND LEVELER

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jan. 31, 1974, Ser. No. 438,264
Claims priority, application Austria, Apr. 26, 1973, 3742/73
Int. Cl.[2] E01B *27/16*
U.S. Cl. 104—12 **8 Claims**



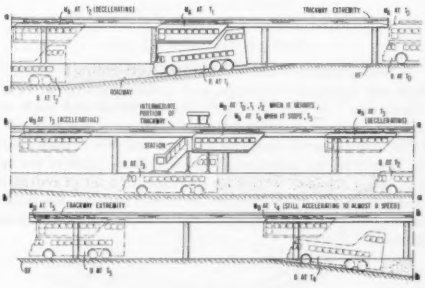
1. A mobile track tamping and leveling machine for obtaining a controlled degree of ballast compaction and leveling a track consisting of rails mounted on ties having two elongated edges extending transversely of the rails and two ends extending in the direction of the rails, the rails and ties intersecting at points spaced in the direction of elongation of the track and the ties resting on ballast, the elongated edges of adjacent ones of the ties defining cribs therebetween, comprising

1. a frame,
2. a reference system including a pickup and transmitter of an error signal for leveling the track in response to the error signal;
3. a track holding device holding the track at the leveled position,
   a. the error signal controlling the track holding device,
4. a tamping tool assembly vertically movably mounted on the frame for tamping a respective one of the ties, the tamping tool assembly comprising
   a. a pair of opposed vibratory tamping tools arranged for immersion in the cribs adjacent the one tie and for reciprocation in the direction of track elongation, with the one tie positioned between the opposed tools,
   b. an additional vibratory tamping tool arranged for immersion in the ballast adjacent the end of the one tie and for reciprocation in a direction transverse to the direction of track elongation, and
   c. drive means for the reciprocation and for the vibration of the tamping tools, and
5. a control for regulating the degree of ballast compaction, the control comprising
   a. regulating means for the drive means, said regulating means comprising separate governors associated respectively with the drive means for the opposed tamping tools and the drive means for the additional tamping tool.

3,910,196
TRANSPORTATION SYSTEM

Richard L. Denenburg, 4319 Telephone Road, Houston, Tex. 77017

Filed Sept. 5, 1972, Ser. No. 286,232
Int. Cl. B61k *1/00*
U.S. Cl. 104—20 **1 Claim**



1. In a transportion system

a vehicle adapted to run along a roadway, a modulus removably supported on the top of the vehicle,

a station on said roadway,

an elevated trackway above the roadway extending therealong continuously for a distance on both approach and departure sides of the station,

said trackway on the approach and departure sides of the station having extreme portions thereof which are vertically separate from the roadway by a certain distance and having an intermediate portion at and adjacent the station which is vertically separated from the roadway by a distance substantially greater than said certain distance, means on said trackway for supporting said module for movement therealong, the vertical separation of the trackway above the roadway at the intermediate portion thereof being sufficient to permit the vehicle to pass freely beneath the modulus when the latter is supported on the trackway,

said trackway having elongate support means extending along opposite sides thereof and disposed laterally outward from a module supported thereon, laterally projecting means on opposite sides of said module overlying said support means,

said laterally projecting means on the module comprising elongate surface means, and means extending lengthwise along the elongate support means on the trackway providing air-cushion support for said elongate surface means,

air-jet means disposed along said trackway for selectively propelling or braking the module, a central control device at said station, and means extending along said trackway for sensing the position of a module thereon and for reporting the same to the central control device, said central control device including means for operating said air jet means for either propelling said module along the trackway or for stopping the module at the station.

3,910,197

OVERHEAD CONVEYOR

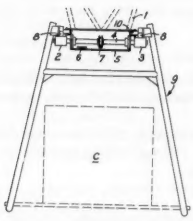
Jean G. Charpentier, Massy, France, assignor to Societe Anonyme dite: S.I.E.T.A.M., Kennedy, France

Filed May 2, 1974, Ser. No. 466,498

Claims priority, application France, May 4, 1973, 73.16194

Int. Cl.[2] B61B *3/00*; **E01B** *25/22*

U.S. Cl. 104—89 **13 Claims**



1. A suspended overhead conveyor comprising a bearer, at least one suspended carriage, and guiding means, the bearer comprising two sets of entraining elements and each suspended carriage depending from two runners; the two sets of entraining elements being installed on and one at each side of the bearer in two substantially parallel lines, each of the runners being adapted to rest on its respective set of entraining elements and to be frictionally entrained thereby, the guiding means being arranged to guide the runners on the entraining elements.

3,910,198

CHAIN-DRIVEN DOG

Bert Krivec, Waukesha, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Continuation of Ser. No. 315,694, Dec. 15, 1972, abandoned. This application Apr. 18, 1974, Ser. No. 462,061

Int. Cl.[2] B65G *17/42*, *17/18*

U.S. Cl. 104—172 B **7 Claims**

1. In a unit carrier system in which a plurality of cars are driven over a trackway, apparatus for accelerating and decelerating the cars, said apparatus comprising:

a. a dog mounted on the exterior of at least some of the cars, each of said dogs comprising

i. a housing;

ii. a forward stop mounted on said housing at a first distance from a first endless chain recited hereinafter,

iii. a rear stop mounted on said housing at a second distance from a second endless chain recited hereinafter, said second distance being different than said first distance, and

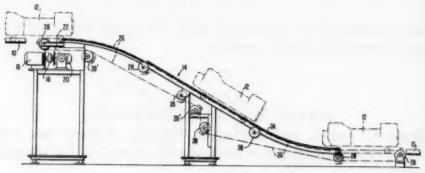
iv. a finger pivotably mounted in said housing and movable between a first position in which it is positioned against said forward stop and a second position in which is is positioned against said rear stop;

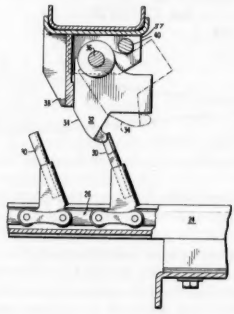
b. a first plurality of pawls;

c. a first endless chain carrying said first plurality of pawls, said first endless chain being mounted adjacent to the trackway in a position such that said first plurality of pawls engages said fingers when they are in their first position;

d. first means for driving said first endless chain in the direction of motion of the cars on the trackway, thereby pushing said fingers against said first stops;

e. a second plurality of pawls of a different length than said first plurality of pawls;





f. a second endless chain carrying said second plurality of pawls, said second endless chain being mounted adjacent to the trackway at a place remote from said first endless chain in a position such that said second plurality of pawls engages said fingers when they are in their second position; and

g. second means for driving said second endless chain in the direction of motion of the cars on the trackway, thereby pushing said fingers against said second stops,

whereby the cars may be accelerated by said first means, acting through said first endless chain, said first plurality of pawls, said fingers, and said first stops, and decelerated by said second means, acting through said second endless chain, said second plurality of pawls, said fingers, and said second stops.

3,910,199

POWER AND FREE CONVEYOR SYSTEM WITH POSITIVELY CONTROLLED DOG

Walter Desmond Ord, Birmingham, England, assignor to Redman Fisher Engineering Limited, Tipton, England

Filed Dec. 28, 1973, Ser. No. 429,638

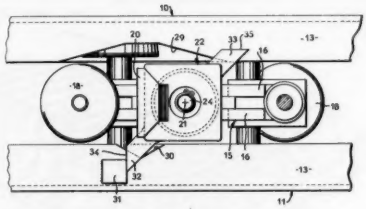
Claims priority, application United Kingdom, June 22, 1973, 29769/73

Int. Cl.[2] B61B *13/00*

U.S. Cl. 104—172 S **9 Claims**

1. In a conveyor system comprising a track, a plurality of trolleys which run on the track, a power driven element supported for movement along a path parallel to the track, a plurality of driving dogs on the power driven element and dogs

on at least some of the trolleys for co-operation with the driving dogs on the power driven element, the improvement wherein: there is provided on at least one of said trolleys a dog which is settable in a selected one of an operative position and an inoperative position with respect to the driving dogs of the power driven element and in a generally horizontal plane, there is provided at a first position along the track first control



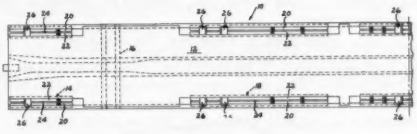
means for acting on the settable dog of said one trolley when said one trolley passes said first position in such a manner as to set the dog positively in its operative position, and there is provided at a second position along the track second control means for acting on the settable dog when said one trolley passes said second position in such a manner as to set the dog positively in its inoperative position.

3,910,200

CONTAINER PEDESTAL AND HOLDDOWN LATCH

Robert R. Girard, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed May 1, 1974, Ser. No. 466,004
Int. Cl.[2] B65J *1/22;* **B61D** *45/00*
U.S. Cl. 105—366 C **50 Claims**



1. A container latch assembly comprising: a container latch comprising a base portion and a latch portion integral therewith; at least one resilient device having means engaging said base portion; said latch portion adapted to be engaged by containers which cause said latch to rotate about a generally vertical axis until said latch has rotated sufficiently for said latch portion to align with engaging means in said containers whereby said resilient device will urge said latch portion to engage the engaging means in said containers and hold the same in engagement with said latch.

3,910,201

REINFORCED STEP WELL

Robert J. Kunst, 11407 Indiana Ave., Chicago, Ill. 60628

Filed Aug. 22, 1974, Ser. No. 499,700
Int. Cl.[2] B61D *23/00*
U.S. Cl. 105—443 **3 Claims**

1. In a railway passenger vehicle having a discharge door providing for passenger discharge at a platform level and having an associated step well unit providing for passenger discharge at a lower ground level,

the vehicle having a pair of laterally spaced longitudinally extending side sills, one of the side sills having an end sill portion and an intermediate sill portion, each of the sill portions being coaxial with the other and longitudinally spaced apart, and

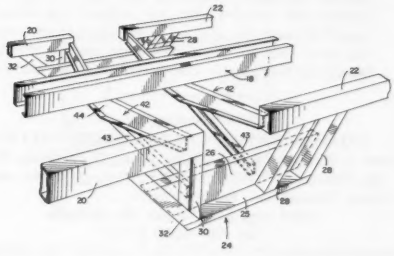
the step well unit rigidly interconnecting the end sill and the intermediate sill,

an improvement in the step well unit comprising:

a step well beam means, said step well beam being a beam spaced below the end sill and the intermediate sill and longitudinally horizontally extending,

a plurality of upwardly extending connector means, each having an upper end and a lower end,

said connector means including a first connector having its lower end rigidly secured to said step well beam



means and its upper end rigidly secured to said end sill, said connector means including second and third connectors, each having its lower end rigidly secured to said step well beam means and its upper end secured to said intermediate sill,

a step reinforcing tube rigidly interconnecting the lower ends of said connectors,

transversely extending upper bearer beams interconnecting said side sills, and

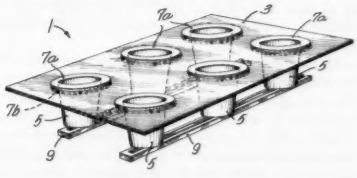
each of said cross beams including a downwardly extending portion rigidly secured to said step reinforcing tube.

3,910,202

PALLET CONSTRUCTION

Paul Skahan, Como, Canada, assignor to Air Sea Packaging Inc., Dorval, Canada

Filed June 24, 1974, Ser. No. 482,515
Int. Cl.[2] B65D *19/00*
U.S. Cl. 108—51 **10 Claims**



1. A pallet construction comprising, in combination;

platform means for supporting material;

leg means depending from said platform means, each leg means having at least one opening in the bottom surface thereof;

and runner means connected to said leg means at the bottom surfaces thereof, said runner means comprising, channel means extending along the length of said runners, means moveable along a top surface of said runners and slidable in said channel means, each said moveable means comprising;

a base portion having a width greater than the width of an opening in the top surface of the runner means which communicates with the channel means, and being holdingly located in said channel means;

an attachment column extending upwardly through said opening from the base portion and terminating above the top surface of the runner means; and

resilient cap means at the top of each attachment column; the resilient cap means, in its normal shape, being larger than the opening in the leg bottom surface, the resilient cap means being deformable, under pressure, to be smaller than the opening in the leg bottom surface and being adapted to snap back to its normal shape when the pressure is released;

whereby the resilient cap means can be deformed to be inserted through a respective opening in a leg bottom surface and whereby, after the resilient cap means has passed through the opening in the leg bottom surface, it will snap back to its normal shape so that the runner means will be holdably connected to the leg bottom.

3,910,203

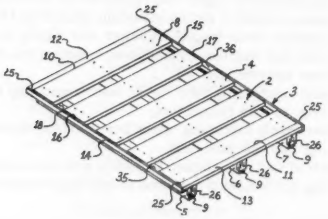
REINFORCED PRODUCT TRANSPORT PALLET

Clark J. Hamkins, Racine, Wis.; Ralph D. Hedding, Thornville, Ohio, and David V. Schaefer, Burlington, Wis., assignors to Tenneco Inc., Racine, Wis.

Filed Aug. 2, 1974, Ser. No. 494,084

Int. Cl.[2] B65D *19/22*

U.S. Cl. 108—51 **10 Claims**



1. A pallet for load bearing having a load bearing face attached to spacer means, said load bearing face having a top surface, a bottom surface, two sides substantially parallel to each other and two sides substantially parallel to each other and substantially perpendicular to said first two sides, the improvement comprising:

a. a portion of said spacer means extending outwardly beyond each of said first two sides of said load bearing face; b. at least a portion of each of said second two sides of said load bearing face extending outwardly beyond said spacer means; and

c. a metal framework extending around the periphery of the load bearing face, a portion of said framework positioned for engagement with the portion of said spacer means extending beyond each of said first two sides of said load bearing face for preventing downward movement of said framework separate from said pallet and a portion of said framework positioned for engagement with a portion of the bottom surface of said load bearing face for preventing upward movement of said framework separate from said pallet for rendering said pallet and said framework substantially inseparable.

3,910,204

STRUCTURAL FOAM SKID

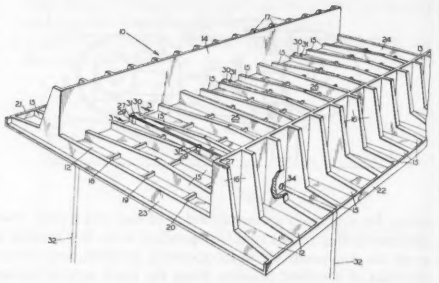
Edwin L. Jesse, West Caldwell, N.J., assignor to Evans Products Company, Portland, Oreg.

Filed June 20, 1974, Ser. No. 481,044

Int. Cl.[2] B65D *19/44*

U.S. Cl. 108—55 **4 Claims**

1. A structural foam skid comprising a load bearing surface member generally rectangular in shape, one relatively thin longitudinal support member extending downwardly from and longitudinally along the underside of said load bearing surface member in close proximity to each side edge of the load bearing surface member, a plurality of buttress means in perpendicular abutting relationship to the outer walls of said longitudinal support members and the bottom of said load bearing surface, a plurality of V-shaped ribs extending downwardly from and transversely across the underside of said load bearing surface member, the maximum height dimension of said V-shaped ribs being generally in the midportion thereof, a



plurality of ribs extending downwardly from and longitudinally along the underside of said load bearing surface member, said ribs having a height less than the height of said V-shaped ribs, at least two lift stabilizing ribs extending downwardly from and transversely across the underside of said load bearing surface member having a uniform height at least equal to the maximum height dimension of said V-shaped ribs, and at least two transversely extending channel means in said skid for carrying strapping material.

3,910,205

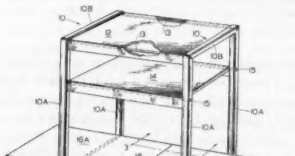
KNOCK DOWN CART CONSTRUCTION

John Gusdore, Creve Coeur, Mo., assignor to Gusdorf & Sons, St. Louis, Mo.

Filed Sept. 6, 1974, Ser. No. 503,652

Int. Cl.[2] A47B *3/06*

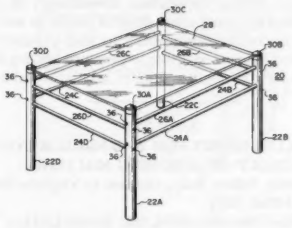
U.S. Cl. 108—101 **4 Claims**



1. In a knock down cart assembly, spaced apart leg frames each having vertical portions and upper cross members connecting said vertical portions, a first elongated shelf, means detachably connecting said leg frames to the opposite ends of said first shelf, a second shelf spaced from said first shelf and having a length greater than said first shelf, said second shelf being formed of two portions having inner ends mating in end-on abutment along a parting plane located between said leg frames and having skirts depending from margins beginning adjacent said mating ends, said skirts being formed with pairs of grooves which align with each other across said parting plane when said shelf portions are mated at said inner ends, shelf portion aligning and clamping means detachably engaged in said grooves and spanning said mated inner ends to retain said two portions in alignment, and means removably connecting each shelf portion to a leg frame, said last connect-

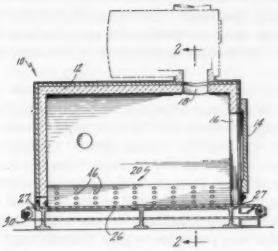
ing means retaining said leg frames in spaced relation and supporting said second shelf such that its two portions extend outwardly beyond said first shelf and beyond said leg frames.

3,910,206
TABLE
Walter M. Jay, 16 Tweed Rd., Fox Lake, Ill. 69920
Filed Jan. 17, 1974, Ser. No. 434,235
Int. Cl.² A47B *3/06*
U.S. Cl. 108—159 **3 Claims**



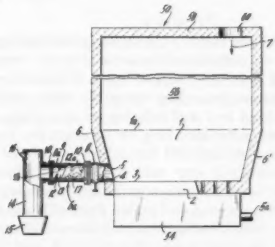
1. Apparatus for supporting parts of a table that includes table legs and a table top comprising:
table top supporting means adapted to receive and support at least one portion of the table top;
leg mounting means on said table top supporting means adapted to mount said table top supporting means to at least one leg of a table;
first positioning means for positioning said leg mounting means in a fixed orientation with a leg of a table;
second positioning means on said table top supporting means for positioning said table top in a fixed orientation with said table top supporting means;
said table legs being tubular;
said first positioning means including a key and a keyway; one of said tubular legs and said leg mounting means including said key and the other including said keyway;
said table top supporting means having an external surface the same size and shape as said leg, whereby said table top supporting means fits adjacent to said leg in a conformable manner;
said leg mounting means having an external surface approximately the same size as the internal surface of a portion of said leg;
said key being mounted to said leg mounting means and extending therefrom a distance substantially the same as the thickness of said tubular leg wall;
said keyway having internal walls conformably fitting about said key, whereby said key provides a surface adjacent to the walls of said table leg;
said second positioning means having a recessed portion in said table top supporting means with internal walls conforming to at least a portion of said table top;
said table top supporting means and table legs each having longitudinal axes positioned to be substantially coincident with each other when a leg mounting means is mounted to the corresponding leg of the table;
said internal walls of said recessed portion being entirely on one side of a diameter passing through the longitudinal axis of the table top supporting means orthogonally thereto, whereby said recessed portion occupies less than one half of the cross-sectional area of the table top supporting means;
said internal walls of said recessed portion forming a rectangular corner adapted to receive the corner of a table top having the shape of a right parallelepiped; and
a cap shaped to fit over said one portion of said table top and at least a portion of said leg mounting means.

3,910,207
APPARATUS FOR PYROLYTIC DECOMPOSITION OF WASTE MATERIALS
Berton G. Altmann, 16700 Cypress Way, Los Gatos, Calif. 95030
Filed May 28, 1974, Ser. No. 473,349
Int. Cl.² F23G *5/00*; **F23L** *1/00*; **F23J** *1/00*
U.S. Cl. 110—8 R **4 Claims**



1. A hearth structure in combination with a pyrolytic waste combustion chamber wherein the hearth structure comprises at least a pair of oppositely disposed elongated sloping walls comprising refractory material which are spaced by and terminate in an elongated openably closed bottom to form a resulting trough-shaped assembly, a plurality of tubes connected to a controlled pressurized air supply through said sloping walls at longitudinally and transversely spaced intervals providing air sufficient to maintain proper waste combustion and fluidization of resulting combusted ash residue, and wherein another pair of similarly oppositely disposed elongated sloping walls are provided by at right angles to the original said pair of oppositely disposed walls.

3,910,208
FLUIDIZED BED FURNACE HAVING COARSE PARTICLE DISCHARGING DEVICE
Erhard Albrecht, Essen; Heinz Wilhelm Oepke, and Herbert Wulfmeier, both of Mulheim, all of Germany, assignors to Rheinstahl AG, Germany
Filed Nov. 8, 1974, Ser. No. 522,312
Claims priority, application Germany, Nov. 9, 1973, 2356061
Int. Cl.² F23G *7/00*; **F23J** *1/00*
U.S. Cl. 110—8 F **10 Claims**



1. A fluidized bed furnace for dehydrated sludge, comprising a furnace housing having a bottom on which the fluidized bed is supported, means for directing combustion air upwardly through said bottom for maintaining the fluidized bed and for reducing the sludge to fine ash dust which is directed out of said furnace with a portion of the combustion air and for also generating coarse particles, wall means extending upwardly from, around and over said bottom and defining a fluidized

bed chamber portion and a combustion chamber thereabove, means for admitting a sludge material connected into said wall means to said combustion chamber adjacent one side thereof, a discharge opening defined in said wall means adjacent said bottom on the opposite side of said wall means from said admitting means to permit withdrawal of relatively large size coarse particles therethrough, a discharge conduit connected to said discharge opening having a rotatable drum portion with an interior wall having a screw thread therein which when rotated will advance coarse particles out of said discharge conduit from said discharge opening, said threads having a pitch large enough to accommodate the size of a largest occurring particle to be moved therebetween through said discharge.

7. A device for use with a fluidized bed furnace which is connectable to the furnace adjacent the bottom thereof, comprising a discharge passage having a rotatable drum portion with an interior wall having a screw thread extending therealong of a pitch such that the spacing between successive thread windings is large enough to accommodate the largest size particles expected to be formed in the fluidized bed and having a central passage defined between the threads for permitting smaller size particles to pass therethrough.

3,910,209

FLUIDIZED BED FURNACE HAVING FUEL AIR SUPPLY LANCE AND A FUEL AIR SUPPLY LANCE CONSTRUCTION

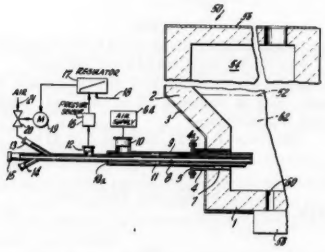
Erhard Albrecht, Essen; Heinz Wilhelm Oepke, and Herbert Wulfmeier, both of Mulheim, all of Germany, assignors to Rheinstahl AG, Germany

Filed Nov. 8, 1974, Ser. No. 522,313

Claims priority, application Germany, Nov. 12, 1973, 2356487

Int. Cl.[2] F23G *7/00;* **F23L** *1/00*

U.S. Cl. 110—8 F **7 Claims**



1. A fluidized bed furnace particularly for burning sludges which have been dehydrated to some degree, comprising a housing having a bottom supporting a fluidized bed thereabove, wall means extending upwardly from said bottom above the fluidized bed and defining a combustion chamber thereabove, means for directing air through the bottom for maintaining the fluidized bed thereabove, a tubular connection socket connected into said wall means adjacent said bottom, a first outer tubular connection extending through said socket and supported and sealed therewith and terminating in an inner end extending into said furnace housing above said bottom in the area of said fluidized bed, said first outer tubular connection having a first compressed air connection adjacent its opposite outer end, a second inner tube extending through said first outer tubular connection and having an inner end terminating in a discharge in said furnace, and having an opposite outer end with a separate second compressed air connection, a fuel connection adjacent said opposite outer end of said second inner tube, pressure-sensing means in said second inner tube downstream of said second compressed air connection and said fuel connection, said sensing means being connected to said second compressed air connection to regulate the supply of air thereto in accordance with the pressure which is sensed.

6. A lance assembly for a fluidized bed furnace, comprising a first outer tubular member adapted to extend through the wall of the furnace and be sealed therewith and having an inner end adapted to be located within the furnace, said outer tubular member having a connection to a first pressure air supply, an inner tubular lance member located within and spaced from the interior walls of said outer tubular member and having an inner end terminating adjacent the inner end of said outer tubular member, said inner tubular member having a second pressure air supply connection, a fuel connection, and a pressure-sensing connection downstream of said fuel and compressed air connection, control means in said second pressure air connection connected to said pressure-sensing connection and being responsive to pressure-sensing for regulating the air flow through said inner tubular member.

3,910,210

UNIVERSAL SUPPORT FOR THE NEEDLE COOLING GROUP OF A SEWING MACHINE

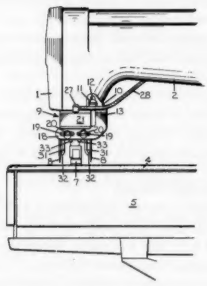
Nerino Marforio, Milan, Italy, assignor to Virginio Rimoldi & C. S.p.A., Milan, Italy

Filed Mar. 20, 1974, Ser. No. 452,721

Claims priority, application Italy, Apr. 12, 1973, 22905/73

Int. Cl.[2] D05B *71/04*

U.S. Cl. 112—218 R **4 Claims**



1. A universal support for the cooling unit of a multi-needle sewing machine comprising:

a. a first angular element adjustably attached to the sewing machine;

b. a second angular element rotatably connected to said first angular element;

c. an air distributor carried on said second angular element and having a single source of air supply;

d. a plurality of air discharge channels in said distributor;

e. a plurality of pipes individually rotatable and longitudinally adjustable carried in and extending from said discharge channels having nozzles forming the outer ends thereof and movable with said distributor on said second angular element to and from a position for directing the air emitted therefrom to the needles of the sewing machine.

3,910,211

DRIVING SYSTEM FOR A SEWING MACHINE

Kuniaki Kubokura, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 17, 1974, Ser. No. 434,237

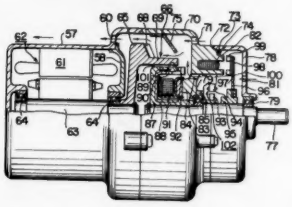
Claims priority, application Japan, Feb. 22, 1973, 48-8610

Int. Cl. D05b *59/22*

U.S. Cl. 112—219 A **12 Claims**

1. A driving system for a sewing machine comprising: a motor included in a motor housing having a stator fixed on

said motor housing, a rotor rotatably arranged opposedly to said stator and a rotary shaft connected to said rotor and supported on said motor housing through a bearing; an electromagnetic coupling including a driving part mounted on one end of said rotary shaft of said motor and interlocked with said rotary shaft, and a driven part rotatably disposed inwardly of said driving part in spaced relationship therewith; an intermediate housing fitted on one end of said motor housing; an output shaft supported on said intermediate housing through



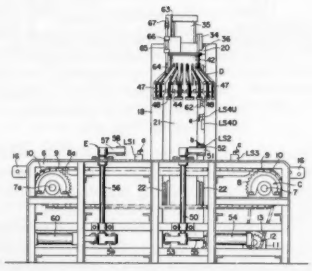
a bearing and having said driven part mounted thereon; said electromagnetic coupling having an exciting coil fixed on said intermediate housing; an electromagnetic brake including a rotor connected to said output shaft; a tachometer generator including a rotor also connected to said output shaft; a command switch energized in reponse to a command by the operator; and means for regulating the electromagnetic force of said electromagnetic coupling and said electromagnetic brake in response to a signal either from said command switch or from said tachometer generator.

3,910,212

APPARATUS FOR AUTOMATICALLY CRIMP CROWNING LIDS ON CANS

Kyoji Konoki; Norisuke Murai, and Sumio Kogawa, all of Nagoya, Japan, assignors to Kikusui Kagaku Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 7, 1974, Ser. No. 521,813
Claims priority, application Japan, May 2, 1974, 49-49527
Int. Cl.[2] B21D *51/34*
U.S. Cl. 113—18 B **3 Claims**



1. Apparatus for automatically crimp crowning lids on cans comprising:

1. a can conveying mechanism (C) having a traveling surface (**10**) with a longitudinal centerline and operated by a motor to convey thereon cans (A) with respective lids (B) fitted thereon in a downstream direction;
2. a lid crimp crowning mechanism (D) comprising:
   a. a movable support structure (**21, 33**) adapted to be vertically movable at a station on one side of said traveling surface,
   b. first motive power means (**23**) for thus moving the movable support structure,
   c. second motive power means (**35**) supported on the movable support structure above the traveling surface and being operable to produce vertical driving movements of a push-pull rod (**38**) directed downward and alined with said longitudinal centerline,
   d. a guide cylinder (**42**) suspendedly supported coaxially with the push-pull rod by the second motive power means and having at the lower end thereof an annular pressing flange (**44**) for pressing down each lid against the respective can body,
   e. a plurality of crimping levers (**47**) pivotally supported by the guide cylinder around the lower peripheral part thereof with uniform circumferential spacing and having at the lower ends thereof respective crimping jaws (**48**) arranged with uniform spacing around a circle coaxial with the guide cylinder and with a crimp crowning position of each can, the crimping levers being pivotally operable to cause the crimping jaws to press inward against the outer periphery of each lid thereby to crimp crown and fasten the lid onto the respective can, and
   f. power transmitting means (**39, 41**) connected between the lower end of the push-pull rod and the upper ends of all of the crimping levers and operated by the push-pull rod to actuate the crimping levers in crimp crowning operation;
3. a conveying control mechanism comprising
   a. positioning means for arresting and holding at said crimp crowning position each can traveling on said traveling surface for said crimp crowning operation and thereafter releasing said can upon completion of the crimp crowning operation, and
   b. standby detention means for arresting and holding a succeeding can in a standby detention position upstream from the crimp crowning position until said completion of the crimp crowning operation on the preceding can and then releasing said succeeding can; and
4. an automatic control system for detecting the operational states of the lid crimp crowning mechanism and the conveying control mechanism and the positional states of the cans on the can conveying mechanism and operating in accordance with said states thus detected to control the operations of the can conveying mechanism, the lid crimp crowning mechanism, and the conveying control mechanism in a predetermined manner thereby to accomplish automatic and continuous crimp crowning operation on cans.

3,910,213

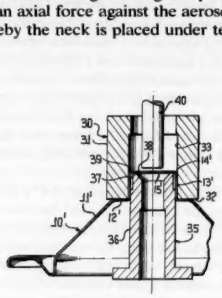
METHOD OF PERFORATING THE NECKS OF AEROSOL CONTAINERS

James Robert Hoenig, Tinley Park, and Salvador Cariasa Mallorca, Chicago, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Nov. 15, 1974, Ser. No. 524,146
Int. Cl.[2] B21D *51/40*
U.S. Cl. 113—120 AA **4 Claims**

1. A method of perforating the necks of aerosol containers comprising the steps of providing an aerosol end for two or three piece containers having an annular shoulder joined by a radius to a cylindrical neck closed by an end wall, positioning the neck in exterior telescopic relationship to a punch having a circumferential axially terminal cutting edge, supporting the aerosol end in its telescoped position by the seating of the end wall upon an end face of the punch, providing an annular guide ring with an internal diameter corresponding generally to the outer diameter of the neck, disposing axes of the punch and guide ring in coincidence with each other, and imparting relative telescopic movement between the punch and guide ring to

a. initially sandwich the aerosol neck between the inner and outer diameter of the guide ring and punch, respectively,
b. apply an axial force against the aerosol annular shoulder whereby the neck is placed under tension, and



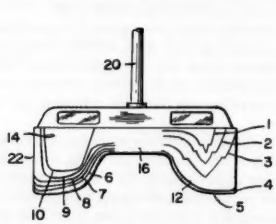
c. ripping the end wall under the influence of the tension forces at the cutting edge whereby at the completion of the telescopic movement the end is ripped from the neck and the latter is completely sandwiched between the guide ring and punch.

3,910,214

SHALLOW DRAFT CATAMARAN

John W. Holter, Box 386, King of Prussia, Pa. 19406

Filed Apr. 18, 1974, Ser. No. 461,991
Int. Cl.[2] B63B *1/12*
U.S. Cl. 114—61 **2 Claims**



1. A shallow draft sailing catamaran capable of making headway without the need for having an extended centerboard, said catamaran having port and starboard hulls secured in fixed relationship to each other, the exterior of each hull being convex and rounded, in transverse section, on its inboard side and having a substantially flat, vertical surface on its outboard side extending throughout a substantial area below the water line whereby the hull offers substantial resistance to leeward motion.

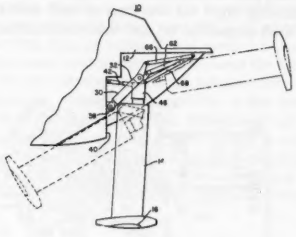
3,910,215

SAFETY SYSTEM FOR HYDROFOIL CRAFT

Kenneth L. Soderman, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 21, 1973, Ser. No. 372,235
Int. Cl.[2] B63B *1/30*
U.S. Cl. 114—66.5 H **5 Claims**

1. In a hydrofoil craft having a hull structure and forward and aft struts carrying foils, a support structure for said forward strut, said support structure being pivotally mounted on the hull structure for movement in the aft direction, the forward strut being pivotally mounted on the support structure for movement relative to the support structure in the forward direction between a retracted position for hull-borne operation of the craft and an extended position for foil-borne operation, and means for restraining the support structure against pivotal movement, said restraining means being a substantially rigid structure adapted to hold the supporting structure against movement under loads below a predetermined value



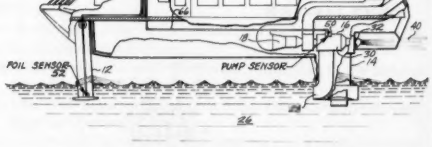
and to yield and permit movement of the support structure and forward strut in response to loads above said value.

3,910,216

HYDROFOIL CAVITATION SENSING AND CONTROL APPARATUS

William M. Shultz, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 10, 1974, Ser. No. 478,117
Int. Cl.[2] H04B *11/00*
U.S. Cl. 114—66.5 H **7 Claims**



1. System for detecting the occurrence of cavitation during the start to maximum speed of the thrust and speed operation of a hydrofoil boat employing liquid propulsion means and strut/foil means, comprising in combination:
a. first transducer means associated with said liquid propulsion means for detecting cavitation noise in said liquid of said propulsion means and for converting said cavitation noise into a first signal;
b. second transducer means associated with said hydrofoil/strut means for detecting cavitation noise about said hydrofoil/strut system ambient liquid medium and converting said cavitation noise into a second signal;
c. receiving means for sensing the presence of said first and said second signals, and for generating an output signal, and
d. means connected to said receiving means and responsive to said output signal for imparting a warning to an operator of said hydrofoil boat signifying the presence of said first and said second signals.

3,910,217
SEED DRILLING MACHINES

Egil Oyjord, Ekornveien 35, 1430 As, Norway

Continuation of Ser. No. 348,788, April 6, 1973, abandoned. This application Sept. 5, 1974, Ser. No. 503,234

Claims priority, application Norway, June 4, 1971, 2127/71; Germany, May 25, 1972, 2225420; France, June 2, 1972, 72.19964

Int. Cl.[2] A01C 7/18

U.S. Cl. 111—77 1 Claim

1. A seed drilling machine including a control feeder, means for feeding seeds at a metered rate to said control feeder and discharge means disposed below said control feeder to receive seeds from an outlet in the underside of the control feeder by gravity and deliver said seeds for sowing, said control feeder comprising a plate, an opening in said plate leading to said discharge means and a circular drum having a plurality of pockets disposed around the periphery thereof, each said pocket providing a seed receiving compartment having an open top with the compartment interior visible to an operator of the machine and being defined by upstanding partition walls extending radially to the drum periphery, said drum being axially rotatable by a drive linkage from a ground wheel to displace the drum compartments sequentially into and out of a seed receiving position beneath said seed feeder and simultaneously to sweep the lower edge of each partition wall over said plate and convey seeds within said pockets to said plate opening, whereby seeds metered from said seed feeder can be visibly observed in said control feeder before gravitationally entering said discharge means and hence provide an indication as to how many individual seeds are sown per unit length.

3,910,218
PROPELLANT-ACTUATED DEEP WATER ANCHOR

Robert J. Taylor, Camarillo, and Richard M. Beard, Oxnard, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 4, 1974, Ser. No. 439,486

Int. Cl.[2] B63B 21/28

U.S. Cl. 114—206 A 15 Claims

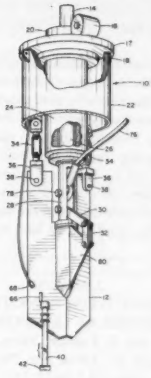
1. A propellant actuated direct embedment anchor system comprising:

a. a launch vehicle having a propulsion system comprised of a gun barrel and firing mechanism attached to a reaction vessel;

b. a piston means engaging the gun barrel;

c. a fluke assembly attached to said launch vehicle by shear pins and a surface of said fluke assembly held tightly in contact with said piston means prior to firing; said piston means providing an inertial force to said fluke assembly after firing and during penetration of the seafloor by pushing against the fluke assembly surface which is held in contact with said piston means without mechanical connection at the point of contact between said surface and piston means, contact between said piston means and said fluke assembly being maintained during initial and final stages of seafloor penetration by the drag on said fluke assembly being greater than on said piston means;

d. said fluke assembly having a configuration which ensures the centers of mass are situated beneath the piston means during firing and penetration to guarantee straight, uniform travel into the seafloor by the inertial force applied thereto from said piston means;



e. means attached to said piston means operable to cause said piston means to separate from said point of contact between said fluke assembly surface and said piston means and to initiate rotation of the fluke assembly from a vertical position to a position of maximum uplift resistance after penetration and embedment is complete.

3,910,219
CONNECTING STRUCTURE FOR OCEAN-GOING PUSH-ARGE

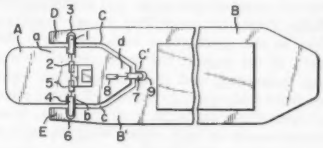
Hiromu Ono, Nishinomiya, and Yoshikiyo Kanefusa, Kawanishi, both of Japan, assignors to Aoki Construction Company Limited, Osaka, Japan

Filed June 5, 1974, Ser. No. 476,689

Claims priority, application Japan, Oct. 5, 1973, 48-111356; Mar. 20, 1974, 49-31289

Int. Cl.[2] B63B 21/64

U.S. Cl. 114—235 R 5 Claims



1. A connecting structure for an ocean-going push-barge combination which comprises:

A. a pusher boat having a bow, sides and a stern, and a center of gravity located intermediate said bow and stern, said boat including at least three connecting pins respectively located at the bow and both sides thereof; said connecting pin at the bow extending generally axially of the boat in a forward direction and said connecting pins on the sides of the boat extending outwardly therefrom in opposite directions; said pins being slidably mounted in the boat for movement outwardly and inwardly thereof;

B. a barge having a longitudinally extending stern including a notch formed therein which extends extirely through the stern of the barge and has a configuration generally complementary to the bow of the barge to permit entrance thereinto of the bow and both sides of said pusher boat, where said connecting pins are located, while the bow of the boat remains in the water, said stern

of the barge having generally vertically extending side walls defining the notch and having a plurality of recesses therein for receiving and holding, said connecting pins, when said pins are protruded from said pusher boat, said receiving and holding recesses being located in groups at positions corresponding to those of said connecting pins, when the boat is received in said notch with the recesses in each group being located in generally vertically spaced alignment; and

C. means in said boat for extending and retracting said pins into and out of the recesses in the barge that are generally aligned therewith, whereby said pusher boat is adapted to be rigidly but separably joined to the barge at a plurality of points on the bow and the two sides thereof to form a single ocean going unit when said pins are extended, while the pins can be released from the barge and reengaged with other recesses therein to accommodate a change in the relative drafts of the boat and barge without movement of the boat out of said notch.

3,910,220

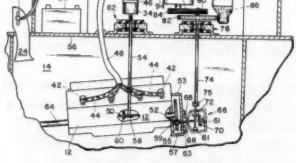
MARINE ENGINE WITH REMOTELY LOCATED ELECTRICAL COMPONENTS

Steve Corson, R.R. No. 1, Luther, Mich. 49656

Filed June 10, 1974, Ser. No. 477,799

Int. Cl.[2] B63J *2/00*

U.S. Cl. 115—.5 R **10 Claims**



1. In a motorboat having an engine compartment enclosing an internal combustion engine, and starting, generating, and distributor means for controlling the application of electrical impulses to the spark plugs associated with the individual cylinders of the engine, the improvement comprising: said starting, generating and distributor means being remotely located from said engine externally of said compartment; and means operatively connecting said starting, generating, and distributor means to said engine whereby operation of said starter, generator and distributor means cannot cause an explosion within said compartment.

3,910,221

ANTI-THEFT DEVICE

Robert L. Aske, 1640 Kilmer Ave., St. Louis Park, Minn. 55426, and Leonard E. Aske, 5508 Park Ave. So., Minneapolis, Minn. 55417

Filed Apr. 15, 1974, Ser. No. 461,007

Int. Cl.[2] B60R *25/00*

U.S. Cl. 116—33 **11 Claims**

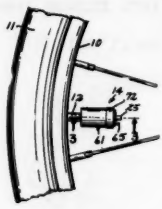
1. An anti-theft device for application to the valve stem of a vehicle tire comprising, in combination:

a hollow housing closed at a first end by an air actuated sound producer and adapted at the second end to be applied to the valve stem;

a piston movable longitudinally in said housing, having a pin extending in the direction of said second end thereof and a radially extending camming surface;

means resiliently urging said piston toward said second end of said housing to an alarm position where said pin may depress the valve core;

means normally preventing movement of said piston toward said alarm position;



and further means including a weight centrifugally slidable on said housing for disabling the last-named means, whereby to initiate actuation of said sound producer and deflation of said tire.

3,910,222

SAFETY AND ALARM DEVICE FOR MONITORING GAS

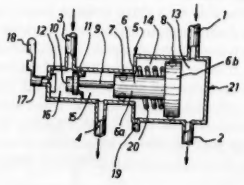
Robert Metivier, 49, rue du Docteur Blanche, 75016 Paris, France

Filed Oct. 15, 1973, Ser. No. 406,470

Claims priority, application France, Oct. 16, 1972, 72.36583

Int. Cl.[2] G01L *19/12;* **A61M** *16/00*

U.S. Cl. 116—70 **3 Claims**



1. A safety and alarm device for combined, main and auxiliary gas supply systems, comprising;

a housing having first and second end portions axially spaced apart and an intermediate portion therebetween; main gas inlet means and main gas outlet means both connected to the housing adjacent the first end portion for normally passing main gas under pressure through the housing for use of the gas;

auxiliary gas inlet means connected to the housing adjacent the second end portion; a first auxiliary gas outlet means connected to the housing in a terminal part of the second end portion most remote from the first end portion;

a second auxiliary gas outlet means connected to the housing at a location axially spaced from the first auxiliary gas outlet means, in the intermediate portion of the housing, for normally passing auxiliary gas through the housing and through the second auxiliary gas outlet means for use of the auxiliary gas;

alarm whistle means operable by auxiliary gas and connected to the first auxiliary gas outlet means;

double port poppet valve means axially shiftable in the housing for passing auxiliary gas from the auxiliary gas inlet means selectively to the first and second auxiliary gas outlet means; and

valve actuator means for axially shifting and selectively holding the valve means to

A. normally close the first auxiliary gas outlet means, thereby inactivating the alarm whistle means and enabling auxiliary gas to flow through the second auxiliary gas outlet means for use, and

B. in response to a predetermined decrease of the pressure of the main gas to prevent the flow of auxiliary gas through the second auxiliary gas outlet means and to enable auxiliary gas to flow through the whistle means, said actuator means comprising, a piston connected with the valve means and axially shiftable in the housing, and spring means in the housing for moving the piston and thereby the valve means toward the first end portion, against the pressure of the main gas, when said pressure is decreased below a predetermined value.

3,910,223

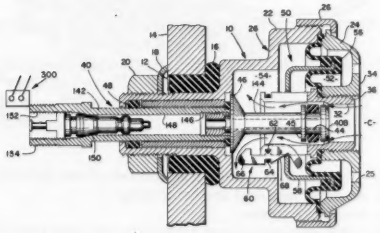
INFLATION AND PRESSURE CHANGE INDICATION DEVICE

Henry W. Krohn, Durham, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 340,502, March 12, 1973, Pat. No. 3,800,736. This application Nov. 16, 1973, Ser. No. 416,478The portion of the term of this patent subsequent to Apr. 2, 1991, has been disclaimed.

Int. Cl.² G01L *19/12*

U.S. Cl. 116—70 **18 Claims**



1. A device for pressurizing a container to be monitored and for indicating variations from reference pressure in the monitored pressurized container, said device comprising:

a housing defining a first and a second chamber, said first chamber in fluid communication with the interior of said container;

means mounted to said housing responsive to a predetermined absolute pressure differential between said first and second chamber, said means in a first position corresponding to less than the predetermined pressure differential between the two chambers blocking fluid communication between the two chambers and in a second position corresponding to at least the predetermined pressure differential between the two chambers establishing fluid communication between the two chambers and indicating the existence of a variation from reference pressure in the monitored pressurized container; and

a fluid passage into said container independent of said means, said fluid passage including a normally closed valve therein.

3,910,224

FAILSAFE DEVICE

Hugh A. Thompson, 5325 Pyrtania, New Orleans, La. 70115, and F. Michael Bauer, Jr., 6409 Ithaca, Metarie, La. 70002

Filed Oct. 23, 1973, Ser. No. 408,316

Int. Cl.² G01N *3/00*

U.S. Cl. 116—114 R **7 Claims**

1. A failsafe device providing warning of impending failure of a member subject to fatigue stresses, comprising:

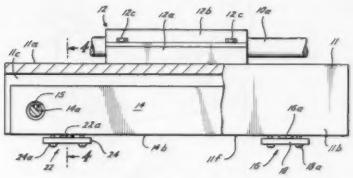
a member that is subject to the vibration of fatigue stress;

a housing;

clamp means for clamping said housing for vibration with said member;

warning means mounted in said housing for movement between a normal position and a warning position;

failsafe means for supporting said warning means in said normal position and for releasing said warning means for movement to said warning position prior to failure of said member;



said housing having opposing side walls;

said warning means being a warning bar mounted for movement between said normal position, in which said warning bar is positioned between said side walls, and a warning position, in which said warning bar is positioned outwardly of said side walls;

said housing side walls having aligned openings therein and said warning bar having an opening therein;

a shaft extending through said aligned openings in said housing side walls and said warning bar; and

said shaft being positioned out of engagement with said warning bar.

3,910,225

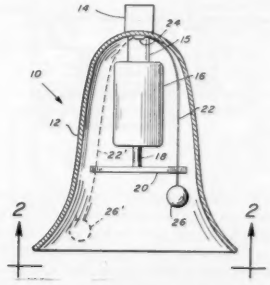
CAROLING BELL SYSTEM

Alvin J. Huber, 5738 E. 61 Pl., Tulsa, Okla. 74136

Continuation-in-part of Ser. No. 323,273, Jan. 12, 1973, Pat. No. 3,769,870. This application Nov. 5, 1973, Ser. No. 412,838

Int. Cl.² G10K *1/072*; **G01F** *1/08*

U.S. Cl. 116—167 **13 Claims**



1. An instrument comprising a bell, a bell striker means for use on the bell, comprising:

a. rotary drive means including at least one rotating arm supported by means in close proximity to the bell,

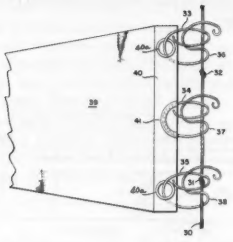
b. striker means comprising at least one striker ball supported on a flexible element fastened at one end to a rigid support, said rotating arm exerting an impulsive force on said flexible element in its rotation and to cause said striker ball to strike said bell.

3,910,226

QUICK LINE COUPLING DEVICE FOR PENNANTS

Welbourne D. McGahee, Melbourne, Fla., assignor to Loop-A-Line, Inc., Melbourne, Fla.

Filed May 7, 1974, Ser. No. 467,681
Int. Cl.[2] G09F *17/00*
U.S. Cl. 116—173 **7 Claims**



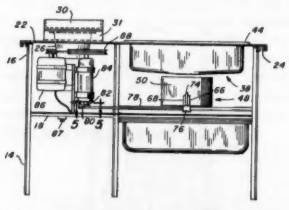
1. A pennant or the like having eyelets or the like, a line, and a quick coupling device in combination, said quick coupling device comprising a horizontal circular member including a back circular portion, a right circular portion, and a front circular portion, said front circular portion having an end adjacent to said back circular portion, a left upstanding bend connected to said back circular portion, a lowered horizontal member connected to said left upstanding bend, a right upstanding bend connected to said lower horizontal member, a middle horizontal member connected to said right upstanding bend, said middle horizontal member continuing upward through a middle upstanding bend passing centrally through sais horizontal circular member and connected to an upper curvilinear member having an end means, said coupling device left upstanding bend passing through said eyelets or the like on said pennant or the like, and said right upstanding bend retaining said line.

3,910,227

HAND BREADER

Vernon E. Reece, 1936 W. 47 Place, Tulsa, Okla. 74125

Filed Nov. 23, 1973, Ser. No. 418,680
Int. Cl.[2] B05C *3/02*
U.S. Cl. 118—29 **6 Claims**



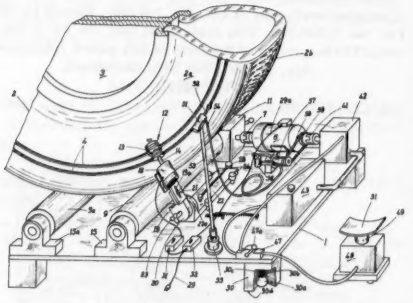
1. A hand breader apparatus comprising a support structure, an apertured top member removably secured on the support structure, batter pan means removably disposed in one of the apertures of the top member, drip tray means removably supported on the top member and having an aperture provided in the bottom thereof in substantial alignment with the batter pan means, flour pan means removably disposed in a second aperture of the top member and having an aperture in the bottom thereof, plug means cooperating with the last mentioned aperture for opening and closing thereof for selectively discharging the contents of the flour pan through the said last mentioned aperture, sifter means removably disposed on the support structure in substantial alignment with said last mentioned aperture, said sifter means being disposed below the bottom of the flour pan means for receiving the discharging contents therefrom, catch pan means removably disposed on the support structure in substantial alignment with the sifter means and disposed therebelow for receiving the contents from the sifter means, shaker means operably connected with said sifter means for shaking thereof to sift the contents therein for discharge of the reusable portion of the contents to the catch pan means, said shaker means including powered crank arm means, radially extending arm means rotatably secured below and extending across the sifter means and operably connected between the crank arm means and sifter means for transmitting oscillation to the sifter means.

3,910,228

TIRE GROOVING APPARATUS

John A. Doll, 7304 Greenlawn Road, Louisville, Ky. 40222

Filed Sept. 18, 1974, Ser. No. 507,148
Int. Cl.[2] B05C *11/00*
U.S. Cl. 118—35 **11 Claims**



1. An apparatus for cutting at least one groove in a side wall of a rotatably mounted tire comprising:

a. base plate means;

b. roller assembly means carried by said base plate means to receive said tire and rotate said tire about its axis in response to rotation of said roller means;

c. rotatable cutter assembly means including rotatable cutter head means and cooperative motive means to rotate said cutter head adjustably connected to said base means to be selectively urged against a selected portion of said sidewall of said tire to cut at least one groove in said sidewall of said tire as said tire is rotated wherein said cutter means is connected to said base means by adjustable arm means assembly to selectively position said cutter head means to contact said sidewall of said tire; and;

d. spring means cooperatively affixed to said adjustable arm means and said base means to continuously urge said cutter head means to contact with said sidewall to maintain continuous contact between said sidewall and said cutter head means during rotation of said tire; and

e. roller assembly motive means to rotate said roller means and said tire while said rotatable cutter head means is in contact with said tire sidewall.

3,910,229

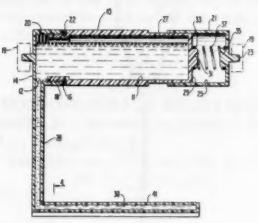
TOILET ROLL PAPER MOISTENING DEVICE

Henry C. Spencer, Suite 4 2637-26th Ave. North, St. Petersburg, Fla. 33713

Filed July 30, 1974, Ser. No. 493,136
Int. Cl.[2] B05C *11/00*
U.S. Cl. 118—43 **7 Claims**

1. In combination in a paper roll holder of the character described, a mandrel body having a first chamber capable of containing liquid and including opposite end portions, means extending normal to said mandrel body associated with at least

one of the end portions of said mandrel body said means having a terminus and capable of carrying a liquid to an arm extending parallel to and spaced from said mandrel body said

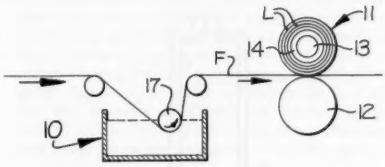


arm further including a second chamber and a plurality of minute perforations which serve to emit the liquid from said first chamber to said second chamber and therefrom through said perforations to an extent of a web drawn thereby.

3,910,230
APPARATUS FOR APPLYING LIQUID TO TEXTILE FABRICS AND THE LIKE

Harry L. Mercer, 1606 Quail Dr., Greensboro, N.C. 27405

Filed Mar. 8, 1974, Ser. No. 449,367
Int. Cl.[2] B05C *11/02, 9/12, 3/12*
U.S. Cl. 118—117 **8 Claims**



1. Apparatus for applying a desired percentage by weight of liquid to a running textile fabric comprising

a. means for applying liquid throughout the width of the textile fabric and in excess of the desired percentage by weight of liquid to be retained in the textile fabric, and

b. means for expressing a predetermined amount of the liquid from the textile fabric to retain the desired percentage by weight of liquid in the textile fabric, said expressing means including,

1. a first moving surface engaging one side of the textile fabric,

2. a second moving surface engaging the other side of the textile fabric and being positioned opposite said first moving surface,

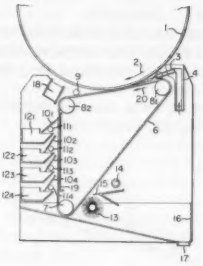
3. at least three distinct layers of textile material defining at least one of said moving surfaces, and

4. means for pressing said moving surfaces together and against opposite sides of the textile fabric to form a nip through which the textile fabric passes so that said distinct layers of textile material absorb and remove the excess liquid from the fabric.

3,910,231
DEVELOPING DEVICE FOR A POLYCHROMATIC ELECTROPHOTOGRAPHIC COPIER

Shozo Inoue, Fussa; Tadashi Sato, Kokubunji, and Tateki Nagaoka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1974, Ser. No. 443,260
Claims priority, application Japan, Feb. 21, 1973, 48-21090
Int. Cl.[2] G03G *15/10*
U.S. Cl. 118—637 **10 Claims**



9. A polychromatic developing device, using a plurality of different color developers for successively developing electrostatic latent images on an image carrier, comprising:

developer supply means for successively supplying different color developers to the image carrier;

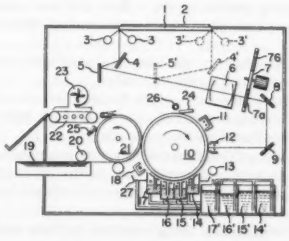
developer holding means including a rotatable endless member for holding and moving said supplied developer away from said image carrier; and

developer collecting means for separately collecting said different color developers held on said holding member, said collecting means including a plurality of movably mounted collecting blades, means for successively moving said blades into contact with said endless member to remove developer therefrom, and a plurality of developer receptables for receiving said different color developers removed by said blades.

3,910,232
COLOR REPRODUCTION DEVICE

Eiichi Kondo, Kawasaki, and Shozo Inoue, Fussa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 11, 1974, Ser. No. 478,317
Claims priority, application Japan, June 14, 1973, 48-67049
Int. Cl.[2] G03G *15/06*
U.S. Cl. 118—637 **4 Claims**



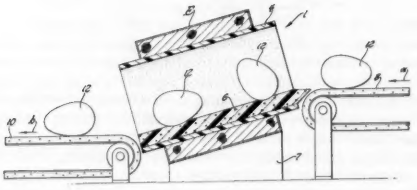
1. A device for color reproduction of an original color image wherein an electrostatic latent image formed on an electrostatic latent image carrying member is developed with multi-color developing agents, which comprise in combination:

a. a plurality of developing means, at least one of said developing means containing therein a black color developing agent;
b. means for recovering said multi-color developing agents which have been intermingled during the image developing process; and
c. means for transferring said intermingled multi-color developing agents from said recovering means to one of said developing means containing therein the black color developing agent.

3,910,233
METHOD AND APPARATUS FOR MAGNETICALLY TREATING EGGS AND ANIMAL SEMEN

Raymond D. Amburn, 8325 Riverland Dr., Bldg. 6, No. 1, Sterling Heights, Mich. 48078

Filed Oct. 4, 1973, Ser. No. 403,571
Int. Cl.[2] A01K *45/00*
U.S. Cl. 119—1 **10 Claims**



1. Apparatus for magnetically treating fragile articles such as fertile eggs and vials of animal semen comprising: a tubular conduit; a magnet mounted on said tubular conduit capable of providing a magnetic field within said tubular conduit of 60 to 120 gauss; and article support means of soft resilient material extending through said tubular conduit for supporting fertile eggs and vials of animal semen in said magnetic field.

3,910,234
QUICK-RELEASE DOG LEASH

Edward V. Henson, East Baton Rouge, La., assignor to David L. Ray, Baton Rouge and Lyman K. Anselmo, Greenwell Springs, both of, La.

Filed Mar. 28, 1974, Ser. No. 455,578
Int. Cl. A01k *27/00*
U.S. Cl. 119—111 **5 Claims**

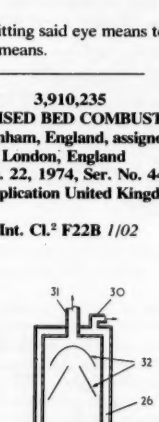
1. A quick-release dog tether comprising:
a. hand strap means;
b. hollow housing means having a first end and a second end, said first end being connected to said hand strap means;
c. eye means attached to said second end of said housing means for receipt of an animal collar;
d. slideable connecting bolt means located in said second end of said housing means adjacent to said eye means for holding said collar in said eye means;
e. cable means located within said housing means attached at one end to said bolt means and at the other end to releasing means located on said first end of said housing means,
  i. said releasing means being adapted to slide said bolt means in said housing means,
  ii. said releasing means comprising a releasing bolt having a ring on a first end thereof and said cable means attached to a second end thereof, said releasing bolt being located in said housing and said ring projecting from said first end of said housing means;
f. spring means in said housing means coiled around said cable means, one end of said spring means resting against said connecting bolt means, and

g. means for permitting said eye means to rotate relative to said hand strap means.

3,910,235
FLUIDISED BED COMBUSTION

John Highley, Cheltenham, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Feb. 22, 1974, Ser. No. 445,282
Claims priority, application United Kingdom, Mar. 2, 1973, 10263/73
Int. Cl.[2] F22B *1/02*
U.S. Cl. 122—4 D **18 Claims**



1. A method for the fluidised combustion of combustible matter including the steps of arranging a first, heat transfer bed of particular material adjacent a second, combustion bed of particular material, introducing a fluidising medium into the first and second beds, introducing combustible matter into the second bed, burning the matter in the second bed, circulating heat conductive material between the first and second beds, passing a heat transfer medium in association with the first bed, and varying the rate of heat transfer in the first bed to the heat transfer medium by varying the rate of circulation of the heat conductive material between the first and second beds.

2. Fluidised combustion apparatus including a combustor body, a lower portion in the combustor body, a particulate

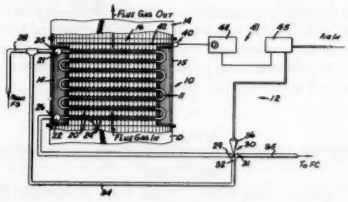
material gas-permeable support plate in the lower portion, a first, heat transfer region in the lower portion above the plate, heat exchange means associated with the first, heat transfer region, a second, combustion region in the lower portion located adjacent the first region, a first fluidising medium inlet means located below the plate and adapted to introduce a fluidising medium to the first region, and a second fluidising medium inlet means located below the plate and adapted to introduce a fluidising medium to the second region.

3,910,236

ECONOMIZER FOR STEAM BOILER

John H. Merritt, Jr., Atlanta, Ga., assignor to Applied Engineering Co., Orangeburg, S.C.

Filed Oct. 10, 1974, Ser. No. 513,555
Int. Cl.[2] F22D *1/02*
U.S. Cl. 122—421 **8 Claims**



1. An economizer unit for use with a steam boiler having a feedwater inlet, a feedwater source, and an exhaust duct through which heated flue gases are discharged, said economizer unit comprising:

an economizer heat transfer coil positioned in the duct so that the flue gases pass therearound in a heat transfer relationship therewith; and,

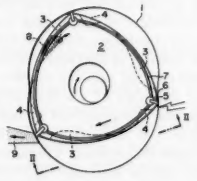
flow control means for selectively directing feedwater to the feedwater inlet of said boiler through said economizer coil to heat the feedwater and directly to the feedwater inlet by-passing said economizer coil, said flow control means response to the average temperature of the flue gases after passage around said economizer coil to maintain the temperature of the flue gases after passage around said economizer coil within a prescribed temperature range above the dew point of the flue gases.

3,910,237

STRUCTURE OF A ROTOR OF A ROTARY PISTON ENGINE

Minoru Morita, Nagoya, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 30, 1974, Ser. No. 465,486
Claims priority, application Japan, Jan. 11, 1974, 49-6482
Int. Cl.[2] F02B *55/14*
U.S. Cl. 123—8.45 **9 Claims**



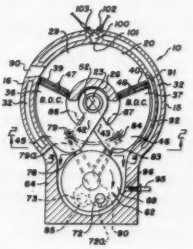
1. A structure of a rotor of a rotary piston engine comprising at least two side housings and a center housing disposed therebetween, said housings defining a casing containing a polygonal rotor eccentrically, rotatably disposed therein, the apexes of said rotor contacting the inside surface of said center housing in a manner to perform suction, compression, combustion, expansion and exhaust strokes due to a change of the volume of chambers defined by said casing and said rotor, an exhaust port provided at the wall of said center housing, the opening of the exhaust port being controlled by the apexes of the rotor, traversing the opening wherein the peripheral portion of said rotor extending between each of the adjacent apexes thereof is provided with a leading recess and a trailing recess, said leading recess being positioned in front of a first point where the rotor contacts the center housing, at the opening phase of the exhaust port, as seen in the rotational direction of the rotor, and said trailing recess being positioned behind a second point where the rotor is in semi-contact with the center housing at the closing phase of the exhaust port, as seen in the rotational direction of the rotor, whereby said first and second points define a flank portion disposed between said leading and trailing recesses, said flank portion isolating the intake side of the rotor from the exhaust side so that the exhaust gas is inhibited from recirculating from a combustion chamber operating in an expansion stroke to another combustion chamber operating in an intake stroke by way of the exhaust port during the period when the apex of the rotor traverse the exhaust port.

3,910,238

PISTON POWER UNIT WITH STRATIFYING IGNITION SYSTEM

Richard James, 5025 Granville St., Vancouver, British Columbia, Canada

Filed June 10, 1974, Ser. No. 478,169
Int. Cl. F02b *53/10*
U.S. Cl. 123—18 R **16 Claims**

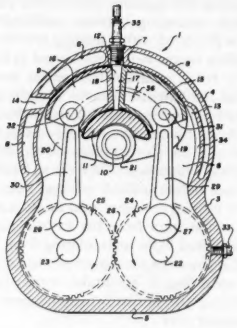


1. In a piston power unit having first and second opposed pistons mounted in a curved cylinder for movement towards and away from each other around a center in compression and power strokes respectively and constrained to move around said centre, each piston having a head at one end thereof facing the opposed piston, an exhaust port and a fuel inlet port closed by said pistons during compression strokes thereof and uncovered when said pistons near the ends of their power strokes, and crankshaft means; an improvement comprising an ignition chamber in communication with the cylinder through an ignition port positioned between said pistons, connecting means between each piston and said crankshaft means, the location of said ignition port and said connecting means being such that the first piston covers or substantially covers the ignition port at the end of the compression stroke thereof following which the pistons move in the same direction until the second piston reaches the end of the compression stroke thereof, means in the ignition chamber for injecting fuel therein while said port is covered or partially covered by the first piston near the end of the compression stroke, and means in the ignition chamber for igniting said fuel.

3,910,239
OPPOSED PISTON POWER UNIT

Richard James, 5025 Granville St., Vancouver, British Columbia, Canada

Filed June 10, 1974, Ser. No. 478,173
Int. Cl.[2] F02B *53/00, 55/00*
U.S. Cl. 123—18 R **9 Claims**



1. A piston power unit, comprising

a cylinder curved longitudinally about a centre and formed with exhaust and intake ports respectively adjacent first and second ends thereof,

first and second opposed pistons slidably fitting in said cylinder for movement towards and away from each other in compression and power strokes respectively, and so as to uncover said exhaust and intake ports respectively during their power strokes, each piston having a head at one end facing the opposed piston and journal means at the other end for journalling the end of a connecting rod, means connected to the other end of each piston constraining said piston to move about said centre when the pistons reciprocate in the cylinder,

first and second crankshafts for the first and second pistons and each having a crank,

means operatively interconnecting said crank-shafts for rotation at the same speed and in phase, and

first and second connecting rods each journalled at one end to the crank of the respective crankshaft and at the other end to the journal means of the respective piston,

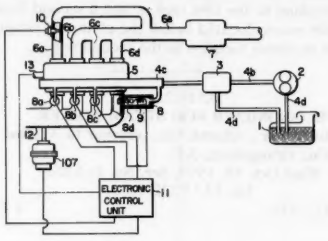
said piston journal means and said cranks being arranged so that the first piston uncovers the exhaust port before the second piston uncovers the intake port.

3,910,240
ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM

Norio Omori, Kariya, and Katsuhiko Oiwa, Handa, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sept. 28, 1973, Ser. No. 401,716
Claims priority, application Japan, Oct. 3, 1972, 47-99562
Int. Cl. F02d *5/02;* **F02b** *3/00*
U.S. Cl. 123—32 EA **4 Claims**

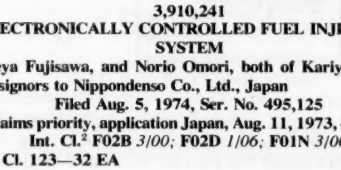
1. An electronically controlled fuel injection system for an internal combustion engine comprising: an electromagnetically operable fuel injection valve provided in the inlet pipe for each cylinder, and an electronic control unit for controlling the duration of the opening of said injection valves with electric pulses having a time width corresponding to an operating parameter of an engine and in synchronism with the rotation of a crankshaft of said engine, wherein said injection valves are divided into two groups, said cylinders and exhaust pipes for said cylinders are divided into two groups corresponding to said two groups of said injection valves, and an oxygen concentration detector is provided in said exhaust pipe in one of said two groups including at least one of said cylinders, whereby a voltage generated by said detector in accordance with the oxygen concentration in exhaust gases is applied to said electronic control unit to control an electric pulse applied to said injection valve corresponding to said exhaust pipe provided with said detector, while a voltage corresponding to an operating parameter of said engine is applied to said electronic control unit and an electric pulse obtained by multiplying said first-mentioned electric pulse by a value corresponding to said operating parameter of said engine is applied to the rest of said injection valves.



3,910,241
ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM

Hideya Fujisawa, and Norio Omori, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Japan

Filed Aug. 5, 1974, Ser. No. 495,125
Claims priority, application Japan, Aug. 11, 1973, 48-90299
Int. Cl.[2] F02B *3/00;* **F02D** *1/06;* **F01N** *3/00*
U.S. Cl. 123—32 EA **4 Claims**



1. In combination with an internal combustion engine having at least two exhaust manifolds, an electronically controlled fuel injection system having a fuel pump for supplying fuel to the system from a fuel tank, fuel injection valves for injecting the fuel into cylinders of said engine, a computor for energizing the fuel injection valves in response to oxygen content in the exhaust gas ejected from the engine and an oxygen content detector mounted in one of said exhaust manifolds of a selected number of cylinders of said engine comprising;

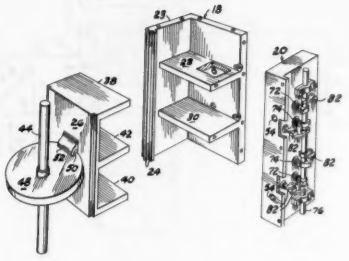
a first fuel pressure regulator connected with said fuel pump and a selected number of said fuel injection valves respectively mounted on said selected number of cylinders for regulating the pressure of the fuel at a predetermined value to supply the regulated fuel to said selected number of said fuel injection valves from said fuel pump and

a second fuel pressure regulator connected with said fuel pump and the rest of said fuel injection valves respectively mounted on the rest of cylinders for regulating the pressure of the fuel at another predetermined value to supply the regulated fuel to said rest of said fuel injection valves from said fuel pump.

3,910,242
INTERNAL COMBUSTION ENGINE

Hawkins Hom, and Rene S. Hom, both of 818 Morningside Dr., Millbrae, Calif. 94030

Filed July 25, 1974, Ser. No. 491,864
Int. Cl.[2] F02B *75/28*
U.S. Cl. 123—57 R 4 Claims

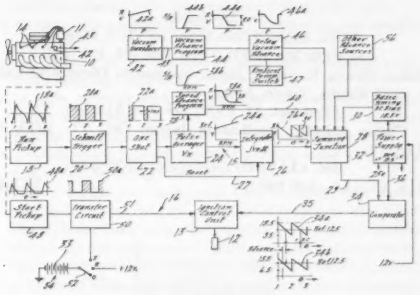


1. A four-cycle internal combustion engine, comprising:
an elongated engine block having end walls and substantially coextensive opposed piston chambers axially parallel with the block axis and having a chamber head forming one wall of the respective piston chamber;
a pair of spaced-apart partitions transversely dividing each piston chamber to form a central combustion chamber and a fuel mixture chamber at its respective ends, the piston chambers being open toward the central portion of said block;
piston means comprising a base plate of less length than said block and reciprocably supported thereby in piston chamber closing relation,
said base plate being provided with lateral vanes to form an E-shaped piston with the endmost vanes of the E-shape disposed within the respective fuel mixture chamber and the central vane forming a piston plate interposed between said partitions and successively forming a compression and exhaust chamber adjacent the respective said partition as said piston plate is reciprocated;
a crank shaft centrally journalled by said end walls;
swash plate means connecting said crank shaft with the respective said piston base plate for reciprocating the latter,
each said chamber head having an exhaust port communicating with the combustion chamber adjacent the respective said partition and having an intake port communicating with the respective fuel mixture chamber,
each said chamber having a pair of transfer ports providing communication between the respective fuel mixture chamber and that end portion of the combustion chamber remote from the respective fuel mixture chamber;
valve means normally closing the respective chamber head ports;
carburetor means connected with each intake port;
cam shaft means supported by each said chamber head and drivably connected with said crank shaft for opening and closing said valve means in a predetermined sequence;
a spark plug supported by said engine block in communication with the combustion chamber on opposing sides of said piston plate and adjacent the respective said partition; and,
ignition means including a distributor and wiring connecting a source of electrical energy with said spark plugs.

3,910,243
ELECTRONIC SPARK TIMING ADVANCE AND EMISSION CONTROL SYSTEM

Leonard P. Gau, Birmingham; Donald E. Riley, Farmington, and Ivor W. Carter, Detroit, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jan. 9, 1973, Ser. No. 322,243
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—117 R 25 Claims

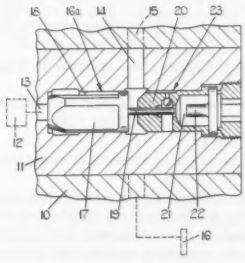


1. In a electronic ignition system for an emissions controlled internal combustion engine; electronic means for forming electrical ignition pulses in response to input signals; a first transducer for producing input signals to said electronic means at a rate related to the rotational speed of the engine and during running operation of the engine; and a second transducer equivalent to and angularly spaced from said first transducer in the direction of engine rotation for producing input signals to said electronic means at a rate related to engine speed during a starting phase of engine operation, and operator controlled means for causing said signals from said second transducer to override the signals from said first transducer and advance the timing of the engine during starting thereof for emission reduction purposes.

3,910,244
FLUID DELIVERY VALVE SPRING

Robert Thomas John Skinner, High Wycombe, England, assignor to C.A.V. Limited, Birmingham, England

Filed Apr. 9, 1974, Ser. No. 459,345
Claims priority, application United Kingdom, Apr. 26, 1973, 19820/73
Int. Cl.[2] F02D *5/00*
U.S. Cl. 123—139 BC 7 Claims



1. A liquid fuel pumping apparatus comprising an injection pump, a distributor member rotatable in a body part, the injection pump and distributor member being driven in timed relationship, the distributor member including a passage communicating with the injection pump, and said passage registering in turn during successive delivery strokes of the injection

pump, with outlet ports formed in the body part, and a delivery valve in said passage, said delivery valve opening during the delivery of fuel by the injection pump, said delivery valve comprising a valve element movable to an open position by the pressure of fuel developed by the injection pump, and a fluid spring against the force exerted by which the valve element moves to the open position, said fluid spring acting in part to effect movement of the valve element to its closed position.

3,910,245

FUEL COMPENSATING DEVICE FOR A SUPERCHARGED TYPE DIESEL ENGINE

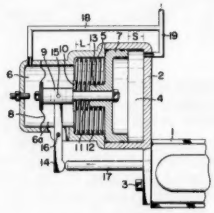
Rikuo Okura, Kawagoe, Japan, assignor to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1974, Ser. No. 514,245

Claims priority, application Japan, Oct. 17, 1973, 48-115739

Int. Cl.² F02D *1/04, 1/06;* **F02B** *1/10*

U.S. Cl. 123—140 MP **3 Claims**



1. A fuel compensating device for a supercharged type diesel engine, comprising three stepped chambers forming a case, a large pressure receiving member and a small pressure receiving member reciprocable in the chambers by supercharging air pressure of the engine and spring forces, a connecting member connecting the pressure receiving members coaxially and provided with springs therebetween and a lever serving as a stopper in the fuel increasing direction for a fuel control rack in a fuel injection pump and being connected with the connecting member so that in low supercharging pressure the small pressure receiving member and the connecting member are movable by movement of the large pressure receiving member and in high supercharging pressure the connecting member alone is movable by the small pressure receiving member.

3,910,246

CONTINUOUS-WAVE HIGH-FREQUENCY AC IGNITION SYSTEM

Robert E. Canup, Chester, Va., assignor to Texaco Inc., New York, N.Y.

Filed Aug. 10, 1973, Ser. No. 387,427

Int. Cl.² F02P *1/00*

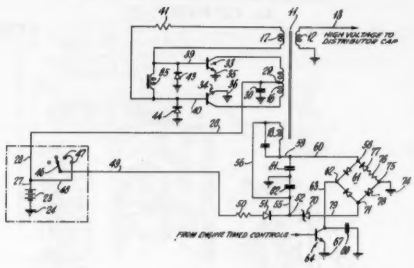
U.S. Cl. 123—148 E **7 Claims**

1. Ignition system for an internal combustion engine, comprising

an inverter including a single transformer having a secondary winding for supplying a continuous-wave, high-frequency spark-signal output only during controlled sparking intervals, a primary winding with at least one transistor connected in circuit therewith, and a feedback winding connected to said transistor for providing an oscillator having a predetermined load frequency during said spark intervals,

said load frequency being substantially different from a harmonic frequency of the fundamental resonant frequency of said secondary winding circuit, and

saturable-core inductor means connected in circuit with said feedback winding for determining the no-load frequency to be substantially equal to said harmonic frequency.



3,910,247

METHOD AND APPARATUS FOR DISTRIBUTORLESS IGNITION

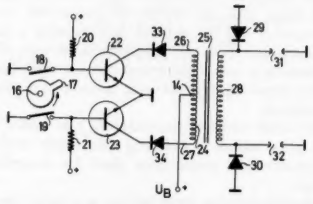
Gunter Hartig, Hansastrasse 29, Karlsruhe 21, Germany (D-7500)

Filed Mar. 25, 1974, Ser. No. 454,737

Claims priority, application Switzerland, July 25, 1973, 10884/73

Int. Cl.² F02P *3/06*

U.S. Cl. 123—148 E **24 Claims**

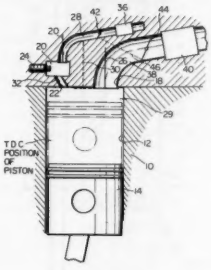


1. A method for distributorless cyclic ignition of an internal combustion engine by sequentially producing from an energy source high tension pulses across a plurality of spark gap means comprising the steps of alternately inducing current to flow in a first and in a second direction in the primary winding of a high tension ignition coil, interrupting said current flow between each change of direction of said flow from either one of said directions to the other, providing at least one pair of spark gap means connected in circuit with a secondary winding of said high tension ignition coil, blocking current flow to one of said spark gap means while enabling current flow to the other of said spark gap means when said secondary winding has induced therein current flow in a given direction, and blocking current flow to said other spark gap means while enabling current flow to said one spark gap means when the direction of current flow through said secondary winding is reversed.

3,910,248
TORCH IGNITED RECIPROCATORY ENGINE AND METHOD OF OPERATING THE SAME

Yasuhiko Nakagawa, Fujisawa, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 25, 1974, Ser. No. 445,160
Claims priority, application Japan, Feb. 26, 1973, 48-22972
Int. Cl.² F02B 19/10
U.S. Cl. 123—191 S 4 Claims



1. A method of operating a torch ignited reciprocatory engine which has a main combustion chamber and an antechamber communicating with the main combustion chamber, comprising, during the intake stroke of the engine, feeding lean and rich combustible mixtures into the main combustion chamber and the antechamber, respectively so that the ratio of the volume V_2 of rich combustible mixture fed into the antechamber to the volume V_1 of lean combustible mixture fed into the main combustion chamber satisfies the relation

$$\frac{V_2}{V_1} \leq \frac{\kappa \cdot \phi}{\epsilon - \phi}$$

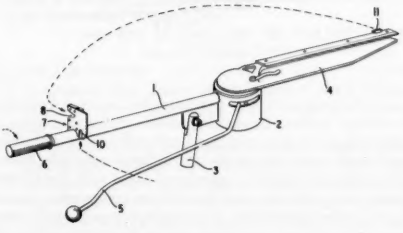
where

ϕ is the ratio of the volume of the antechamber to the clearance volume at TDC, ϵ the compression ratio, and κ a correction coefficient.

3,910,249
LOCKING AND RELEASING MEANS FOR THE THROWING ARM ON CLAY PIGEON THROWING APPARATUS

Arne Gustafsson, Vikingstad, Sweden, assignor to Stiga AB, Trans, Sweden

Filed Sept. 11, 1974, Ser. No. 504,928
Int. Cl.² F41B 3/04
U.S. Cl. 124—8 7 Claims



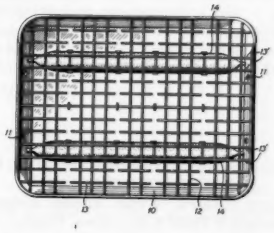
1. In a clay pigeon trap having a throwing arm, a casing containing bearing means rotatably mounting said throwing arm, a rearwardly-directed tubular shaft projecting laterally from said casing, spring tensioning means for spring loading the throwing arm, and a laterally projecting retaining loop member towards the outer end of said throwing arm, a releasable catch device which is adapted to co-operate with said loop member to hold said throwing arm, against said spring loading, in a rearwardly-directed position alongside the tubular shaft prior to a throwing stroke so that, on release, the throwing arm executes a throwing stroke and swivels forwards through approximately 180° under the influence of the spring loading, wherein said releasable catch device comprises:

a. a bracket member upstanding on the tubular shaft at a position spaced from the rear free end of said shaft;
b. an upwardly-extending slideway provided by said bracket member;
c. an aperture in the top side of said tubular shaft in alignment with said slideway;
d. a slide member which is slidably mounted for up and down movement in said slideway and which extends through said aperture into the interior of said shaft;
e. a notch in the bracket member to receive the loop member of the throwing arm; and
f. detent means to engage said loop member, said detent means being carried by said slide member so that when the slide member is in a raised position the detent means closes the entrance to said notch to retain said loop member therein and when the slide member is depressed into a lowered release position the detent means disengages said loop member and opens the entrance to said notch thereby to release the throwing arm.

3,910,250
GRILL FOR BROILING MEAT, FISH, VEGETABLES

John Harry Orsing, Avangsgatan 2, 253 71 Helsingborg, Sweden

Filed June 18, 1974, Ser. No. 480,477
Claims priority, application Sweden, June 19, 1973, 7308594
Int. Cl.² F24C 01/16; F24B 03/00; A47J 37/07
U.S. Cl. 126—9 A 1 Claim



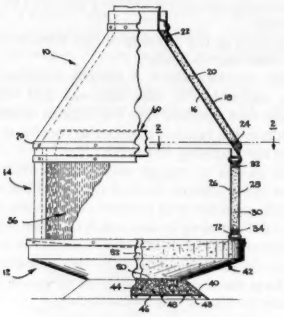
1. In combination with a metal broiling tray having a bottom wall and side walls, a grate covering said tray for supporting food to be broiled above said bottom wall, said tray comprising first and second wires crossing each other and connected at the points of crossing, and retainers adapted to support a fuel cartridge, said retainers constituting downwardly extending sections of said first wires selected in laterally spaced pairs on opposite sides of an adjacent pair of said second wires, thereby to provide parallel forks for embracing and holding a fuel cartridge therebetween.

3,910,251

FIREPLACE

Lyman R. Andrew, Santa Rosa, Calif., assignor to Viking Universal Company, Pittsburg, Calif.

Filed Apr. 5, 1972, Ser. No. 241,297
Int. Cl.[2] F24B *1/18*
U.S. Cl. 126—120 **40 Claims**



1. An improved fireplace comprising:

heat insulative means forming a bowl and pedestal for supporting a fire, including, in order from the bottom of the pedestal to the top of the bowl, means forming an air cell for convecting air, means forming a first compartment containing mineral wool, means forming a second compartment containing 5/8 light weight aggregate, means forming a third compartment containing an insulative reinforced concrete, bowl-shaped, casting made of a mixture of substantially equal parts of 5/8 light weight aggregate, light weight sand, vermiculite, and cement.

3,910,252

OPEN HEARTH-ROOM-HEATING DEVICES WORKING ON CLOSED CIRCUIT

Gilbert Gerard Richard, Yerres, France, assignor to Cheminees Richard le Droff S.A., Yerres, France

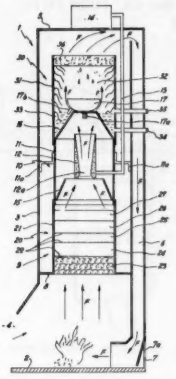
Filed Feb. 5, 1974, Ser. No. 439,710
Claims priority, application France, Feb. 23, 1973, 73.06527; Dec. 18, 1973, 73.45154
Int. Cl.[2] F24B *1/18*
U.S. Cl. 126—120 **23 Claims**

1. A gas circulating and purifying device in combination with a fireplace having a hearth open to the atmosphere and on which combustion is effected, said device comprising:

means defining a path for gases extending from an inlet in the upper part of said fireplace to an outlet in its lower part leading to said hearth,

suction means in said path for creating a flow of the gaseous mixture formed by said combustion from said inlet toward said outlet, said suction means comprising a static nozzle in said path and means for directing a flow of fluid under pressure through said nozzle to create a depression upstream of said nozzle, and

purifying means in said path for separating entrained particles from said gaseous mixture and for absorbing noxious gases from said mixture.

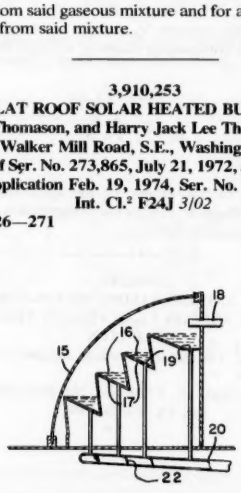


3,910,253

FLAT ROOF SOLAR HEATED BUILDING

Harry E. Thomason, and Harry Jack Lee Thomason, Jr., both of 6802 Walker Mill Road, S.E., Washington, D.C. 20027

Division of Ser. No. 273,865, July 21, 1972, abandoned. This application Feb. 19, 1974, Ser. No. 443,197
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **4 Claims**

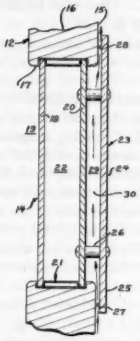


1. Solar heat collecting apparatus for use on a more-or-less horizontal surface comprising means defining a solar heat collecting pond area, said pond area comprising a plurality of small heat collecting ponds one stepped upwardly from another, means to fill the uppermost pond with liquid until it spills over to fill the pond therebelow, return pipe means for liquid leaving said ponds, fluid conduit means inter-connecting the ponds and return pipe means to permit each pond to drain, means in said return pipe to permit or stop draining as desired, and means to prevent flow from the uppermost pond to the pond therebelow through said conduit means and return pipe.

3,910,254
OVEN DOOR CONSTRUCTION

Harold R. Morgan, Dolton, Ill., assignor to Dearborn Glass Co., Bedford Park, Ill.

Filed Nov. 28, 1973, Ser. No. 419,764
Int. Cl.² F23M 7/00
U.S. Cl. 126–198 10 Claims



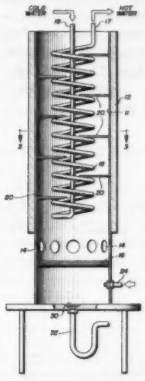
1. An oven cabinet construction comprising:
wall means defining an oven cavity having a front opening;
a door movably carried by said wall means for selectively closing said opening and having a window structure permitting viewing the oven cavity from forwardly of the door when the door is in a closed position across said opening, said window structure including a transparent light having a front surface exposed to forwardly thereof;
an auxiliary transparent light;
spacer means; and
means for securing said spacer means to said window light inwardly of the periphery thereof to extend forwardly from the front surface of said window light, and for securing said spacer means to said auxiliary light, whereby said spacer means and securing means define means for mounting said auxiliary light on said window light to be spaced forwardly of said front surface thereof and defining therewith an entrance passage at the bottom of said auxiliary light and an exit passage at the top of said auxiliary light for flow of ambient air upwardly through the space between said lights to maintain said auxiliary light at a preselected low temperature suitable to avoid injury to a person accidentally touching said auxiliary light when the oven is heated, said auxiliary light having an area substantially greater than the area of said window light to overlie a portion of the door adjacent the window structure.

3,910,255
CATALYTIC FLUID HEATER

John E. Sharer, Evanston; Jon B. Pangborn, Lisle, and Raymond J. Dufour, Wheaton, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Feb. 15, 1974, Ser. No. 442,793
Int. Cl.² F24H 1/00
U.S. Cl. 126—350 R 4 Claims

1. A catalytic fluid heater which is fueled with a hydrogen-rich gas and of a construction which requires no external venting comprising:
a. a housing forming a combustion chamber open at the top end thereof and having orifice means for delivering said fuel into said housing at the lower end thereof, said housing further having an inlet means disposed above said orifice means for permitting air to flow into said housing for mixing with said fuel and being of a height to create a chimney effect to pull the air-fuel mixture through said housing from the lower to the top end thereof;
b. a tubing through which a fluid to be heated flows formed and vertically supported within said housing;
c. a plurality of plates supported by said tubing in various symmetric locations along the vertical axis of said tubing, said plurality of plates having a catalyst active with said hydrogen-rich gas applied to the lower surfaces thereof;
d. said fuel-air mixture in flowing upwardly through said housing impinging on said catalyst and being thereby combusted and producing condensate as a combustion product;
e. the combustion of said fuel-air mixture heating said plurality of plates and the fluid flowing through said tubing

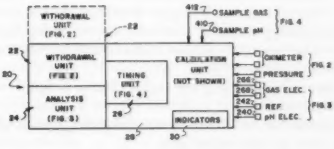


being heated both by convection from the rising gases and by conduction from said plurality of plates;
f. said plurality of plates being cooled by the fluid flowing through said tubing and said condensate such as to maintain the temperature of said catalyst below the auto ignition temperature of hydrogen whereby a flameless combustion of said fuel-air mixture results and negligible concentrations of oxides of nitrogen are formed, thus eliminating the need for external venting to an outside atmosphere.

3,910,256
AUTOMATED BLOOD ANALYSIS SYSTEM

Justin S. Clark, and Lloyd George Veasy, both of Salt Lake City, Utah, assignors to Primary Childrens' Hospital, Salt Lake City, Utah

Division of Ser. No. 319,561, Dec. 29, 1972, Pat. No. 3,838,682. This application July 22, 1974, Ser. No. 490,603
Int. Cl.² A61B 5/00; A61M 5/00
U.S. Cl. 128—2 G 17 Claims



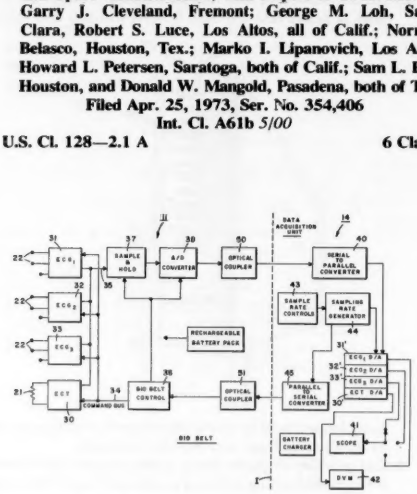
1. A method of timing of blood withdrawal and examination system connected to a patient via a catheter, comprising the steps of:
filling the system with at least one biologically inert fluid;
calibrating the system;
withdrawing blood, upon command, from the patient through the catheter into the system in fluid-to-fluid contact with the inert fluid;
sensing the inert fluid/blood interface at a blood examination site;
automatically and instantaneously discontinuing the withdrawal step when the sensing step occurs;

applying pressure to the inert fluid to push substantially all of the blood out of the system through the catheter and back into the patient.

3,910,257
MEDICAL SUBJECT MONITORING SYSTEMS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Garry J. Cleveland, Fremont; George M. Loh, Santa Clara, Robert S. Luce, Los Altos, all of Calif.; Norman Belasco, Houston, Tex.; Marko I. Lipanovich, Los Altos; Howard L. Petersen, Saratoga, both of Calif.; Sam L. Pool, Houston, and Donald W. Mangold, Pasadena, both of Tex.

Filed Apr. 25, 1973, Ser. No. 354,406
Int. Cl. A61b *5/00*
U.S. Cl. 128—2.1 A **6 Claims**



3. A medical monitoring system for monitoring at least one physiological signal from a plurality of transducers mounted on the body of a subject being monitored, said system comprising a bio-unit, to be associated with the subject, a data acquisition unit, and a bidirectional coaxial cable having a signal bus line and command data bus line linking the bio-unit with the data acquisition unit;

said bio-unit comprising a plurality of signal-conditioning channels and means for selectively controlling the signal conditioning channels,

each signal conditioning channel comprising:

a signal conditioner for conditioning the analog signal generated by the transducer, and

multiplexing means for selectively sampling at preselected rates for each channel the output of the individual signal conditioner upon signal from the data acquisition unit;

an analog-to-digital converter for receiving the multiplexed analog data from said selected channel and for converting it into digital data,

means for applying the digital data to a signal bus line in said cable,

means for receiving command data from a command bus line in said cable; and

coupling means in said coaxial cable electrically isolating the bus unit from the data acquisition unit,

said data acquisition unit comprising:

a plurality of digital-to-analog converters one for each channel for reconverting the digital data into analog data,

timing control logic means for controlling the digital-to-analog converters and for selectively generating said command data, which activates the multiplexing means and determines selectivity of sample rate of individual signal conditioning channels, and

utilization means coupled to said digital-to-analog converter for monitoring the reconverted analog data.

3,910,258
CEREBRAL ACTIVITY MONITOR

Lech Pisarski; Adelbert W. Valiensi, both of Los Angeles; Lee R. Baessler, Manhattan Beach, and Harvey F. Glassner, Los Angeles, all of Calif., assignors to Humetrics Corporation, Los Angeles, Calif.

Filed Apr. 18, 1974, Ser. No. 462,123
Int. Cl.² A61B *5/04*
U.S. Cl. 128—2.1 B **17 Claims**

1. A cerebral activity monitor comprising:

A. means to derive electroencephalographic signals from a patient;

B. rectifier means connected to receive selected ones of said signals and to transform the selected signals into a unipotential signal of varying magnitude impulses;

C. integrator means connected to said rectifier means to generate a voltage that tends to change in one direction between successive ones of said impulses and tends to return to an initial value at the occurrence of each of said impulses that has at least a certain magnitude;

D. a level detector circuit connected to said integrator means to be actuated when said output signal of said integrator changes in said one direction beyond a predetermined level, said level detector circuit returning to a predetermined output voltage value each time said voltage returns to said initial value;

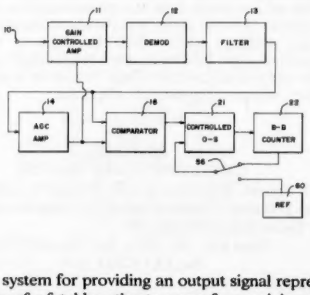
E. a switching circuit connected to said level detector to be actuated by the output signal from said level detector and comprising a time constant circuit to start a change of charge level from the same predetermined initial level each time said switching circuit is actuated; and

F. warning means connected to said time constant circuit to be actuated when the charge level of said time constant circuit reaches a predetermined actuating value.

3,910,259
SYSTEM AND METHOD FOR DETERMINING FETAL HEART RATE

John William Sullivan, Los Altos, Calif., assignor to Gould Inc., Chicago, Ill.

Filed Nov. 23, 1973, Ser. No. 418,438
Int. Cl.² A61B *5/02*
U.S. Cl. 128—2.05 T **11 Claims**



1. In a system for providing an output signal representative of the rate of a fetal heartbeat: means for receiving a Doppler signal which varies in frequency according to the rate of fetal heart movement, means for processing the Doppler signal to eliminate frequencies outside a predetermined range corresponding to an expected range of fetal heartbeats, said predetermined range including at least one higher frequency which is harmonically related to a lower frequency in the range, means responsive to the processed Doppler signal for delivering output pulses at a rate corresponding to the fetal heartbeat, and means responsive to the output pulses for conditioning the means for delivering such pulses not to deliver pulses in response to harmonics of the Doppler signal which may be present in the processed signal.

3,910,260

METHOD AND APPARATUS OF TREATING HEART ATTACK PATIENTS PRIOR TO THE ESTABLISHMENT OF QUALIFIED DIRECT CONTACT PERSONAL CARE

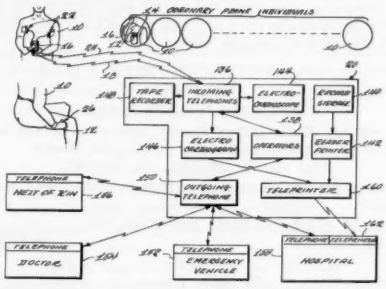
Stanley J. Sarnoff, Bethesda, and Herbert E. Reinhold, Jr., Rockville, both of Md., assignors to Survival Technology, Inc., Bethesda, Md.

Division of Ser. No. 311,835, Dec. 4, 1972, abandoned, and a continuation-in-part of Ser. No. 230,753, March 1, 1972, Pat. No. 3,792,700. This application Nov. 21, 1973, Ser. No. 418,125

Claims priority, application Israel, Feb. 13, 1973, 41530; Italy, Feb. 23, 1973, 12475/73; Argentina, Feb. 23, 1973, 246777; Belgium, Feb. 26, 1973, 128115; Spain, Feb. 28, 1973, 412169; France, Mar. 1, 1973, 73.07259; United Kingdom, Feb. 14, 1973, 7301/73; Australia, Feb. 21, 1973, 52415/73; Germany, Mar. 1, 1973, 2310320; Mexico, Feb. 26, 1973, 141801; Switzerland, Feb. 26, 1973, 2779/73; Netherlands, Mar. 1, 1973, 7302874; Canada, Feb. 23, 1973, 164454; Brazil, Feb. 28, 1973, 149173; Sweden, Feb. 28, 1973, 7302820-1; Japan, Feb. 28, 1973, 48-24244The portion of the term of this patent subsequent to Feb. 19, 1991, has been disclaimed.

Int. Cl. A61b *5/04*

U.S. Cl. 128—2.06 R **8 Claims**



7. A method for effecting pre-hospital phase treatment of a coronary prone individual prior to the establishment of qualified direct contact personal care at a time during the early minutes or hours after the onset of heart attack sumptoms and for enabling qualified personnel to participate by telephone in such treatment, which individual has been previously provided with ready access to (1) at least one injector suitable for self-administration under the disconcerting circumstances present during the aforesaid time containing a liquid dosage of a medicament injectable into the tissue of the individual effecting the self-administration of the injector, which medicament (a) when so injected is generally effective to reduce the incidence of adverse cardiac conditions, such as ectopic beats, when the existing heart beat condition is within a predetermined portion of the total range of heart beat conditions which may exist during an attack, and (b) may be inadvisable or unwise to to inject when such heart beat conditions are outside the predetermined portion of the total range in which the medicament is effective as aforesaid, and (2) a diagnosing device including a pair of electrode bodies having exterior surface means for enabling the bodies to be easily positioned in the armpits of an individual and to be conveniently and comfortably self-retained in such position solely by the individual by engagement between the adjacent arm portions and torso in the armpit areas and battery operated signal producing means operable when said electrode bodies are so positioned to provide signals indicative of the existing heart beat conditions of the individual, including signals capable of being transmitted by telephone representative of the electrical impulses which trigger the heart beats, said method comprising the steps of:

1. obtaining access to the aforesaid accessible device and injector;
2. positioning said electrode bodies within the armpits of the individual and self-retaining the same therein solely by the individual by engagement of the bodies between the adjacent arm portions and torso in the armpit areas;
3. sensing through the operation of said electrode bodies while self-retained as aforesaid the electrical impulses which trigger the heart beats of the individual;
4. producing through the operation of said battery operated signal producing means signals indicative of the existing heart beat conditions of said individual including a signal corresponding with each successive heart beat of said individual capable of being transmitted by telephone;
5. utilizing at least some of the signals produced as aforesaid as a basis for determining that the injector obtained by said individual contains medicament which is effective as aforesaid;
6. visually identifying the injector containing the effective medicament, and
7. administering the identified injector containing the effective medicament and injecting said effective medicament into the tissue of said individual so that said injected medicament will reduce the incidence of adverse cardiac conditions, such as ectopic beats, in said individual prior to the establishment of qualified direct contact personal care for said individual.

3,910,261

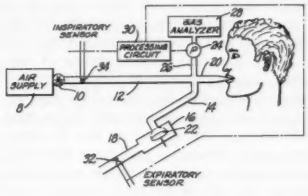
END-TIDAL GAS ANALYSIS APPARATUS FOR RESPIRATORS

Charles W. Ragsdale, Riverside, and James Weigl, Rialto, both of Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed June 11, 1974, Ser. No. 478,429

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—2.07 **9 Claims**



1. End-tidal gas analysis apparatus suitable for use with a respirator of the type having an air source actuated in response to patient demand and a conduit system which includes inspiratory and expiratory conduits for respectively delivering air to and receiving air from a patient, said apparatus comprising:

means for analyzing gas contained in said conduit system,

means for supplying gas from said conduit system to said analyzing means,

actuator means adapted to sense the beginning of patient expiration and to initiate operation of said gas supplying means after a predetermined delay period following the beginning of said patient expiration, and

deactuator means adapted to sense the beginning of patient inspiration and rapidly terminate operation of said gas supplying means in response thereto,

said actuator means and deactuator means cooperating to operate said gas supplying means for substantially the full interval between the end of said delay period and the beginning of patient inspiration, and to inhibit operation of said gas supplying means during substantially the full remainder of the time the analysis apparatus is in use.

3,910,262

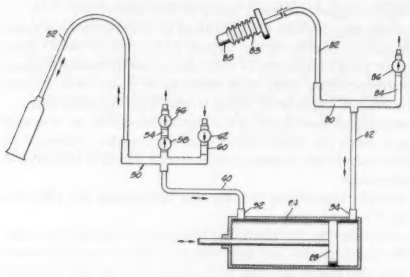
THERAPEUTIC APPARATUS

Dan T. Stoughton, 6220 Coldwater Canyon, North Hollywood, Calif. 91606

Filed Nov. 4, 1974, Ser. No. 520,237

Int. Cl.[2] A61H *1/00*

U.S. Cl. 128—40 **3 Claims**



1. Apparatus including: a frame; a cylinder mounted on the frame having at least one port therein; a piston reciprocally mounted in said cylinder for driving air out of and for drawing air in through the port as the piston is moved reciprocally in the cylinder; an electric motor mounted on said frame; crank linkage means mechanically coupling said electric motor to said piston for causing reciprocal movement of the piston in the cylinder when the motor is energized, a male genital engaging massaging sleeve; a manifold; a first tube coupling the manifold to the sleeve; a second tube coupling the manifold to the port in said cylinder; a first air line coupling the manifold to the atmosphere; a check valve mounted in the first air line to exhaust air through the first air line to the atmosphere for each positive stroke of the piston and to close and seal the first air line for each negative stroke of the piston; a manually adjustable valve mounted in the first air line to control the volume of air exhausted to the atmosphere for each positive stroke of the piston and thereby to control the volume of air fed to the sleeve for each positive stroke of the piston; a second air line coupling the manifold to the atmosphere; and a check valve mounted in the second air line to open the second air line to the atmosphere when the suction pressure of the air drawn into the second air line for each negative stroke of the piston exceeds a particular threshold, so as to provide a limit to the suction pressure passing through the second tube to the sleeve for each negative stroke of the piston.

3,910,263

METHOD AND A DEVICE FOR OBTAINING A DESIRED, SUBSTANTIALLY CONSTANT ADJUSTABLE FORCE IN AN ATTACHING POINT

Olof Wallander, Torbjorn Klockares Gata 18 A, 113 30 Stockholm, Sweden

Filed June 13, 1974, Ser. No. 479,182

Claims priority, application Sweden, June 13, 1973, 7308347

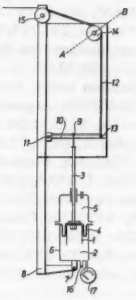
Int. Cl.[2] A61H *1/02*

U.S. Cl. 128—75 **9 Claims**

1. Apparatus for providing a desired, substantially constant adjustable force at the point of attachment to the patient of a tensioning device for the surgical tensioning treatment of patients having injuries to their skeleton and/or soft parts so that the force remains independent of the position of the attachment point, movements of the patient and/or other acceleration forces comprising in combination:

a tensioning device having one end thereof attachable to a patient;

means for providing a constant tensioning force without the aid of an external power source including a cylinder divided into two chambers, one chamber thereof being evacuated to a predetermined subatmospheric pressure and the other chamber thereof being in communication with the atmosphere, a piston and a sealing means mounted within said cylinder and separating said two



chambers from each other, and a piston rod connected to said piston; and, an adjustable force changing means for connecting said piston rod to said tensioning means and for adjusting the force supplied to said tensioning means to the desired constant value.

3,910,264

PASSENGER LOADING RAMP

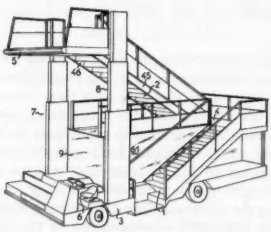
Yves Mahieu, Hamel Arleux, France, assignor to Societe Anonyme dite: Ateliers Mecaniques du Douaisis, France

Filed Apr. 9, 1974, Ser. No. 459,392

Claims priority, application France, Apr. 10, 1973, 73.13351

Int. Cl.[2] E06C *5/16;* **B64F** *1/30*

U.S. Cl. 182—63 **10 Claims**



1. A passenger loading ramp, comprising;

a chassis;

a lower flight of steps fixed to said chassis, extending obliquely upwardly therefrom, and having an uppermost step;

an upper flight of steps on said chassis having a first end portion movably disposed adjacent the uppermost step of the lower flight, having a second end portion remote from said uppermost step and extending obliquely upwardly, and having a substantially horizontal platform terminally fixed to said second end portion;

means for vertically moving the platform and the second end portion of the upper flight of steps on the chassis and relative thereto; and

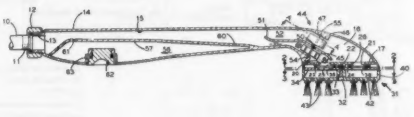
retractable passage means for horizontally connecting the uppermost step of the lower flight of steps to the upper flight of steps, said passage means comprising a generally horizontal floor which is at least partly movable in a horizontal plane including said uppermost step to extend in said plane from said uppermost step to the intersection

of said plane with the obliquely extending, second end portion of said upper flight of steps.

3,910,265
HYGIENIC DEVICE

Martin Richard Coleman, 3261 Harold St., Oceanside, N.Y. 11572

Filed May 18, 1973, Ser. No. 361,560
Int. Cl.[2] A61H 9/00; A46B 11/06
U.S. Cl. 128—66 9 Claims

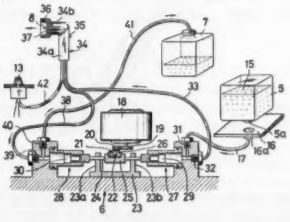


1. A hygienic device comprising a shaft having a conduit formed therein for promoting continuous flow, a scrubbing head secured to said shaft and having at least one port formed therein for fluid communication with said conduit, means for regulating said fluid communication, said scrubbing head being rotatable relative to said shaft for selectively registering said scrubbing head port with said conduit port, and means within said conduit for automatically varying the intensity of said fluid flow through said shaft.

3,910,266
METHOD AND APPARATUS FOR BEAUTY AND THERAPEUTIC TREATMENT

Hiroshi Kawase, Tokyo, Japan, assignor to Ricoh Watch Co., Ltd., Nagoya, Japan

Filed Aug. 13, 1974, Ser. No. 496,924
Claims priority, application Japan, Aug. 15, 1973, 48-91604
Int. Cl.[2] A61H 9/00
U.S. Cl. 128—66 5 Claims

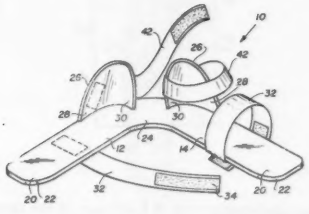


1. A method for beauty and therapeutic treatment of a predetermined area of skin characterized by (a) spraying a liquid on said skin from a nozzle at a pressure of 3–10 kg/cm^2 and with a pulse frequency in the range of 800–3000 cpm; (b) maintaining said pressure and pulse frequency on said predetermined area of said skin by providing said nozzle with a cover; (c) pressing said cover against said skin so as to maintain a predetermined distance from said nozzle to said skin; and (d) maintaining said pressure and pulse frequency of said liquid on said skin until said liquid has permeated into said skin a predetermined distance.

3,910,267
CHILDREN'S CORRECTIVE FOOT SPLINT

Reuben H. Reiman, 23 Beachway, Port Washington, N.Y. 11050

Filed Aug. 14, 1974, Ser. No. 497,196
Int. Cl.[2] A61F 3/00
U.S. Cl. 128—80 A 3 Claims



1. A foot splint for attachment to the feet of a child for correcting toe-in and related abnormalities comprising

an open unitary substantially planar support for the full length of each foot,

means between and unitary with said foot supports and connecting the same together at a fixed diverging angle. a heel support unitary with and extending partially about each of said foot supports,

said heel supports having major and minor curved portions, said heel supports having their major curved portions extending along and for a length of its respective foot support at the lateral outer portion thereof to apply a lateral inward force to the heel of a foot positioned thereagainst and said minor curved portions being directed inward about its respective foot support for a portion thereof and delineating the heel of its respective foot support,

each said heel support extending upward from said foot support for a height sufficient to apply a support agianst which the heel of a foot positioned thereagainst is restrained,

and instep strap means on each of said foot supports to engage about the instep of a foot positioned on a respective foot support to inhibit the medial rotation of the forefoot by applying a lateral outward force thereto in opposition to the lateral force of said heel support and ankle means on each of said heel supports for circumferential engagement about the ankle of a foot positioned on said foot support to apply a lateral outward force in opposition to the lateral inward force of said heel support, said foot supports being greater in length and lesser in width than that of a foot to be positioned thereon to enable said instep strap means to apply its lateral outward force to the foot.

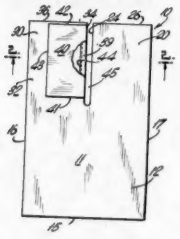
3,910,268
SURGICAL DRAPE

Shirley A. Miller, Loveland, Ohio, assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Dec. 12, 1974, Ser. No. 532,283
Int. Cl.[2] A61F 13/00
U.S. Cl. 128—132 D 16 Claims

1. A surgical drape comprising a sheet of flexible, drapable material, said sheet having a main portion at one end thereof and a pair of spaced wings at the other end thereof, said wings extending outwardly from a central region of said sheet and defining a gap in said sheet; and a flap on at least one of said

wings, said flap being transversely extendible from said one wing so as to cover at least a portion of said gap and to lie in



contacting relationship with at least part of the other of said pair of wings when the drape is placed on a patient.

3,910,269

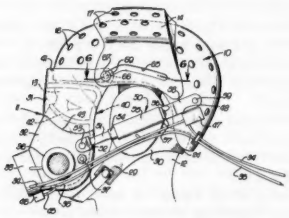
INTEGRATED HELMET AND MASK STRUCTURE

William K. Ansite, Glendale, and John J. Mitchell, Jr., Arcadia, both of Calif., assignors to Sierra Engineering Co., Sierra Madre, Calif.

Division of Ser. No. 255,838, May 22, 1972, Pat. No. 3,833,935. This application Mar. 11, 1974, Ser. No. 449,777

Int. Cl.[2] A62B *7/00*

U.S. Cl. 128—142 **7 Claims**



1. An integrated helmet and mask structure for the head and face of a wearer, said structure comprising a hard helmet shell, a visor assembly including a mask shell and having an articulated attachment on each side to the helmet shell and valve means on the mask shell including a supply of breathing gas for directing such gas to the mask structure, said mask shell having an inner surface adapted to face the face of the wearer, means for moving the mask shell toward and away from a position adjacent the face of a wearer, a hollow sealing tube extending around the edge of the mask shell on the side thereof facing the face, said sealing tube having a fixed sealed attachment to said mask shell, a hose in communication between the valve means and the sealing tube for introducing breathing gas from the supply for the valve means into said tube, said tube having a normally collapsed condition in a direction perpendicular with respect to the inner surface of the mask shell at all locations of attachment, said sealing tube being withdrawn from the adjacent face of the wearer when not subject to gas under pressure and an inflated condition when subject to gas under pressure, the tube when in inflated condition under pressure of gas from said gas supply being adapted to have a sealing relationship with the face of the wearer.

3,910,270

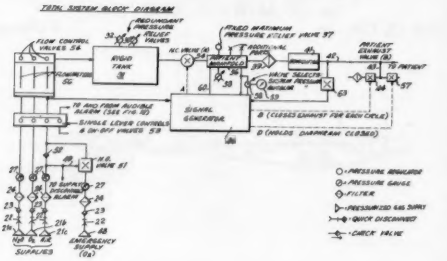
PORTABLE VOLUME CYCLE RESPIRATOR

Jeffrey Lee Stewart, New York, N.Y., assignor to Bio-Med Devices, Inc., Stamford, Conn.

Continuation of Ser. No. 287,936, Sept. 11, 1972, abandoned. This application Feb. 25, 1974, Ser. No. 445,758

Int. Cl. A61m *16/00*

U.S. Cl. 128—145.8 **13 Claims**



1. A portable volume cycle respirator powered by gas pressure alone, comprising means for supplying medical gas to a patient for inspiration during a first period of time, pneumatic logic means for preventing, for a preselected second period of time exhalation of gas by said patient subsequent to said first period, valve means for permitting exhalation of gas by said patient during a third period of time subsequent to said second period of time.

3,910,271

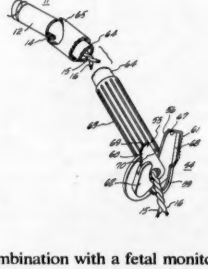
METHOD OF MAKING A BIPOLAR ELECTRODE STRUCTURE

Theodore C. Neward, 521 Scripps, Claremont, Calif. 91711

Division of Ser. No. 366,701, June 4, 1973, abandoned. This application May 24, 1974, Ser. No. 473,144

Int. Cl.[2] A61B *5/04*

U.S. Cl. 128—2.06 E **5 Claims**



1. The combination with a fetal monitoring device, having a flexible guide tube dimensioned for insertion through the vagina and cervix of a woman in labor; electrode means disposed initially at the inner end of the guide tube for attachment and electrical contact with a fetus upon rotation thereof; a flexible drive tube slidable and rotatable in the guide tube and removably attachable to the electrode means to effect rotation thereof; and conductors extending from the electrode, means through and beyond the drive and guide tubes for connection to an electrical monitoring apparatus, of a drive and clamp means disposed at the outer ends of the guide and drive tubes, and comprising:

a. a tubular drive means secured to the flexible drive tube to receive the conductors extending therethrough;

b. a first conductor clamping element fixed to the tubular drive means, extending laterally therefrom and having a

perforation aligned with the drive means to receive the conductors;

c. a second conductor clamping element also extending laterally from the drive means, overlying the first clamping element and perforated to receive the conductors;

d. and yieldable means tending to cause relative offsetting movement of the perforations thereby to clamp the conductors.

3,910,272

CANNULA FOR INTRODUCING A FLEXIBLE CATHETER

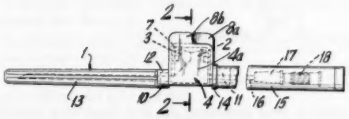
Hans Jürgen Forberg, Lensahn, Germany, assignor to Transcodan Sven Husted-Andersen, Germany

Filed Nov. 15, 1973, Ser. No. 416,292

Claims priority, application Germany, Nov. 18, 1972, 2256748

Int. Cl.² A61M *05/00*

U.S. Cl. 128—214.4 **4 Claims**



1. A bacteria-resistant packing for a cannula, comprising a tubular protective cap for the cannula having a closed end and an opposite opened end, a tubular catheter guard having a closed end and an opposite opened end and adapted to contain a catheter, an intermediate closed housing having an open chamber therein comprising interengaged side walls having respective opposite top and bottom, a connecting web extending between said bottoms of said side walls, said tops being interengaged and closed, said housing having oppositely spaced ends extending from the side wall bottoms each end having an opening over which the open end of said catheter guard and said protective cap extend, said protective cap and said catheter guard being sealed with said intermediate housing when said housing is closed, said intermediate housing side walls being pivotal about a respective said bottom to open said intermediate housing, said side walls having complementary projections and recesses enclosed within said chamber and which interengage to form a closed bacteria-resistant joint.

3,910,273

ASPIRATING HYPODERMIC SYRINGE

Sven Arlers, Goteborgsvagen 77, Partille, Sweden (43300)

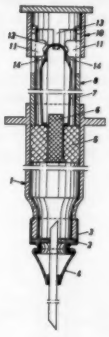
Filed Mar. 6, 1974, Ser. No. 448,746

Claims priority, application Sweden, Mar. 8, 1973, 73032351

Int. Cl.² A61M *5/315*

U.S. Cl. 128—218 P **5 Claims**

1. In a hypodermic syringe of the type cooperating with a cylindrical ampoule and provided with means for performing aspiration prior to injection, having a displaceable plunger connected to a piston rod and closing one end of said ampoule, said plunger being provided with an axial spigot extending from the end surface of the plunger proximate said ampoule and projecting endwise beyond the end surface of the plunger remote from the ampoule, said piston rod being sleeve-shaped and telescoped within the cylindrical internal wall of the ampoule, said ampoule having a hollow needle extending from the other end thereof, the improvement wherein said piston rod at its end remote from the ampoule engages an operating device axially sliding against the outer surface of said piston rod, said operating device being connected to clamping means extending through slits in said piston rod towards the inside and engaging with said plunger over a connecting device attached to said piston rod, said connecting device extending through said piston rod and having means engaging with said axial spigot on movement of said operating device toward said ampoule, the outer end of said operating device being provided with a divided end plate, one portion of which is fixed to said operating device and the other portion being hingedly connected to said fixed portion, said hinged portion turning outwards on movement of said operating device toward said ampoule by projecting means on



the outer rim of said piston rod, repositioning of said hinged portion lifting up said spigot by said connecting device, thereby causing an inward bulging of said proximate end surface of said plunger, resulting in aspiration.

3,910,274

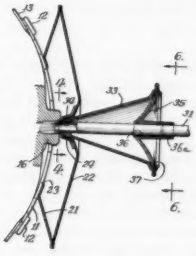
STOMA IRRIGATING SYSTEM

John L. Nolan, Glenview, Ill., assignor to Hollister Incorporated, Chicago, Ill.

Filed Mar. 18, 1974, Ser. No. 451,942

Int. Cl.² A61M *3/00*

U.S. Cl. 128—227 **5 Claims**



1. A device for irrigating the stoma of an ostomy patient comprising, a reservoir for irrigating fluid, a tube communicating with the reservoir, a cone of plastic material having an apex to be inserted into the stoma, said cone being of relatively soft pliable plastic material having an opening at its apex, a flange on the inner surface of the cone adjacent said opening and surrounding the same, said flange providing an annular stop having an inner diameter smaller than the outer diameter of said tube, a diaphragm of relatively stiff plastic material secured to the base of the cone, a hollow guide cylinder extending through the diaphragm along the axis of the cone to guide the tube to be inserted therethrough to the apex of the cone, said tube and cone delivering irrigating fluid from the reservoir into the stoma.

3,910,275

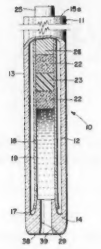
ARTIFICIAL INSEMINATION DEVICE

Victor Stephen Babey, 151 Canboro Road West, Village of Fonthill, County of Welland, Ontario, and Ernst Scheiblauer, 37 Claremount Circle, Town of Welland, Welland County, Ontario, both of Canada

Continuation of Ser. No. 824,920, May 15, 1969, abandoned. This application Aug. 23, 1971, Ser. No. 174,255

Int. Cl.[2] A61D *7/02;* **A61M** *37/02*

U.S. Cl. 128—234 **10 Claims**



6. An artificial insemination device comprising a hollow semen straw device containing a predetermined unit dosage of semen with a predetermined external diameter and predetermined wall thickness having a movable plug internally disposed at one end thereof, the other end being openable for discharge of contents therefrom;

an elongated rigid tubular body receiving said straw and being of predetermined internal diameter greater than the external diameter of said straw formed of synthetic plastic material and defining a clearance between the exterior diameter of the straw and the internal diameter of the body of between 2 and 4 times the wall thickness of the straw;

an ejection tip member with a discharge passageway extending therethrough formed of synthetic plastic material secured at one end of said tubular body;

a sealing extension member formed integrally with said ejection tip of generally tapering shape for extending into said tubular body and into said open end of said straw and haivng a circular top of predetermined diameter less than the internal diameter of said straw and an opening connected to said discharge passageway; and

an operating rod extending into said body for engaging said plug in said straw and forcing the same towards said extension.

3,910,276

MICRO-SURGICAL LASER SYSTEM

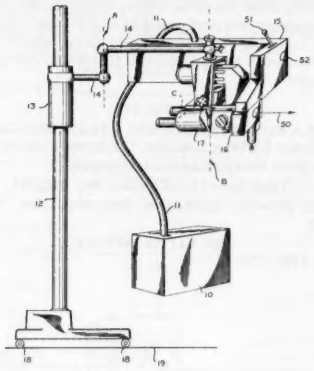
Thomas G. Polanyi, Bolton; Jan Pejchar, Maynard, and Robert A. Wallace, Wayland, all of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed May 23, 1974, Ser. No. 472,779

Int. Cl.[2] A61N *3/00*

U.S. Cl. 128—303.1 **16 Claims**

1. A surgical laser system comprising in combination a system support, an operation microscope mounted on said support, means for aiming said microscope in any desired direction, a stereo laser endoscope operatively and fixedly connected to said microscope, an infra-red laser device supported by said microscope said device operatively and fixedly connected to said endoscope, and peripheral means for energizing, cooling, and providing gas and fluid flow to said laser device.



3,910,277

CRYOPROBE AND FLEXIBLE CONNECTOR THEREFOR

Hildebrand Zimmer, Ahrensburg, Germany, assignor to Dragerwerk AG, Germany

Filed Apr. 24, 1974, Ser. No. 463,773

Claims priority, application Germany, Apr. 26, 1973, 2321089

Int. Cl.[2] A61B *17/36;* **F16L** *11/12, 11/18*

U.S. Cl. 128—303.1 **21 Claims**

1. A heat insulated flexible line particularly a coaxial double line for connecting a cryoprobe with an operating unit to supply a cooling medium, comprising a flexible inner medium supply tube for supplying low boiling point medium to the probe, an outer tube surrounding said inner tube and defining an annular medium return flow space between said outer and inner tubes for the return of the medium, spacers surrounding said inner tube at spaced axial locations supporting said inner tube within said outer tube and permitting free flow of the return medium therethrough, and a plurality of axially arranged heat insulation rings arranged in end to end articulated interengagement around said outer tube whereby to provide deformation-free flexibility for the flexible connecting line.

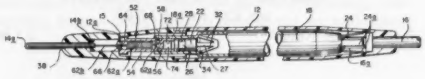
6. A flexible conecting line according to claim **1,** wherein said line includes a tubular extension portion adapted to extend outwardly from the end of the flexible connecting line and into a probe housing surrounding said inner conduit and being spaced therefrom to define a return flow conduit communicating with the return flow conduit between said inner tube and said outer tube.

8. A flexible connecting conduit according to claim **7,** including a probe housing engaged over said plug extension and having a closed end forming a contact probe surface and an interior evaporation chamber adjacent said closed end, said inner tube extending into said evaporation chamber and terminating in an opening at a spaced location from the closed end of said probe.

3,910,278
CRYOSURGICAL PROBE

William H. Crandell, Lexington, Mass.; Wayne F. Lisenbee, Simi, and Keith E. Nelson, Los Angeles, both of Calif., assignors to Dynatech Corporation, Burlington, Mass.

Filed June 3, 1974, Ser. No. 475,787
Int. Cl.[2] A61B 17/36
U.S. Cl. 128—303.1 18 Claims

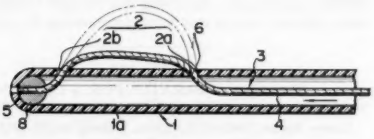


1. A self-contained cryosurgical probe comprising
A. a pencil-like housing,
B. a refrigerant-containing cartridge slidably positioned in the housing,
C. a hollow, thermally conductive tip projecting from one end of the housing,
D. a plunger assembly positioned within the housing between the cartridge and the tip,
E. a small diameter capillary tube connected to the plunger assembly, said tube having
1. one end thereof communicating with the plunger end adjacent to the cartridge,
2. its other end positioned inside the tip near its outer end, and
3. a substantial length intermediate its said ends formed into a small diameter multi-turn coil,
F. means on the plunger assembly for opening the cartridge when the cartridge is slid toward the plunger assembly, and
G. means for sliding the cartridge toward the plunger so that the plunger opens the cartridge and releases the refrigerant which thereupon flows through the capillary tube to the probe tip and cools the tip.

3,910,279
ELECTROSURGICAL INSTRUMENT

Takeshi Okada, Hachioji, and Kazuhiko Mitsui, Tokyo, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed June 19, 1974, Ser. No. 480,855
Claims priority, application Japan, June 20, 1973, 48-72170[U]
Int. Cl.[2] A61B 17/32
U.S. Cl. 128—303.15 6 Claims

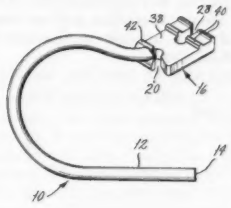


1. An electrosurgical instrument for resecting the tissue of a body cavity comprising:
a flexible insulating tube including a forward end portion substantially straight along the axial line of the tube and having a fixed tip end and a pair of axially aligned holes formed in a side of the forward end portion of the tube;
a flexible electrode wire affixed to said tip end and capable of being manually forced into and withdrawn from the tube along its axis, said electrode wire including a body section having a base end disposed within said tube lengthwise thereof, an end section fixed within the tip end of the forward end portion of the tube and a working section outside of the tube having both of its ends respectively connected to the body section and the end section and projectively looped in an axial plane through said pair of holes and radially adjustable in response to the force exerted on said electrode wire; and
means for connecting said base end of the body section to a source of electric current including means to radially adjust the working section whereby said looped working section may be brought into contact with the tissue of the body cavity thereby to resect said tissue.

3,910,280
BODY MEMBER TOURNIQUET

Daniel A. Talonn, University City, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed June 21, 1974, Ser. No. 481,576
Int. Cl.[2] A61B 17/12
U.S. Cl. 128—327 6 Claims



1. A body member tourniquet comprising an elongate member having a smooth, rounded outer surface formed of a soft, flexible material, and a relatively rigid head including a relatively flat main portion having opposed ends and opposed sides, and a projection connected to one of said ends and extending generally angularly relative to the upper and lower faces of said main portion, one end of said elongate member being secured to said projection, said main portion having a pair of holes extending therethrough between the upper and lower faces thereof with the holes spaced from each other and each of said opposed ends and opposed sides and with one of said holes closer to said one end than the other of said holes, and entrance slot means extending through said main portion from the periphery thereof to each of said holes to allow insertion of the side walls of said elongate member through said entrance slot means and into one of said holes after said elongate member has been placed about a body member, the diameter of each of said holes being less than the width of said elongate member and greater than the width of said entrance slot means.

3,910,281
SUTURE ANCHOR

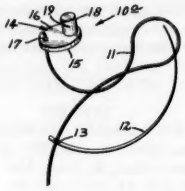
Harold D. Kletschka, Minneapolis, and Edson H. Rafferty, Excelsior, both of Minn., assignors to Bio-Medicus, Inc., Minnetonka, Minn.

Filed Oct. 9, 1973, Ser. No. 404,297
Int. Cl. A61b 17/04
U.S. Cl. 128—335 4 Claims

1. A suture anchor comprising:
a. a suture having one end adapted for connection to a needle;
b. an enlarged anchoring member connected to the other end of said suture, the enlarged anchoring member comprising a flat disc having opposed side surfaces;
c. a cylindrical post projecting from one of said side surfaces and adapted to be grasped by a surgical instrument during

a suture tying procedure; and

d. a friction slot formed in the cylindrical post to releasably



receive and anchor the suture during the suture tying procedure.

3,910,282

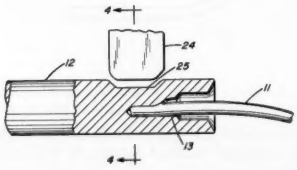
NEEDLING MONOFILAMENT SUTURES

Philip Joseph Messer, Brookfield, and Sol Singerman, E. Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 22, 1974, Ser. No. 472,264

Int. Cl.[2] A61B *17/06*

U.S. Cl. 128—339 **1 Claim**



1. A stainless steel suture in combination with a surgical suture needle comprising: a stainless steel monofilament surgical suture and a needle, the needle comprising a pointed end on said needle, a round cylindrical shank portion of said needle, and an axial suture socket portion at the back end of the needle and of uniform diameter with the shank, said socket portion consisting, before crimping, of a suture holding bore slightly larger than said suture at the inner end of the socket, and an essentially concentric cylindrical counterbore slightly larger than the suture holding bore, between said suture holding bore and the back end of the needle, said suture being inserted and retained in said suture holding bore in said needle, retention being by at least a portion of said suture holding bore being crimped into frictionally engaging relationship with said suture, in which the stainless steel suture diameter, the suture holding bore diameter and depth, the counterbore diameter and depth, and needle diameter are selected from the table:

Suture Size	Suture Dia.	Needle Dia.	Suture holding bore Dia. & Depth	Counterbored Dia. & Depth
1/0	.013–.016″	.039″	.0182–.0192″ .085″	.0284–.0294″ .025″
2/0	.010–.013″	.039″	.0152–.0162″ .060″	.026–.027″ .025″
3/0	.008–.010″	.039″	.0125–.0135″ .060″	.021–.022″ .025″
4/0	.006–.008″	.039″	.0093–.0102″ .042″	.0182–.0192″ .010″
5/0	.004–.006″	.034″	.0075–.0083″ .035″	.0152–.0162″ .010″

and the crimp shows an imprint about 0.015 inch wide, about 0.025 inch longitudinally of the needle, and deep enough to firmly hold the suture, whereby said counterbore prevents bending of said suture adjacent to the crimped portion, and insures that flexing of the suture occurs behind the suture holding bore.

3,910,283

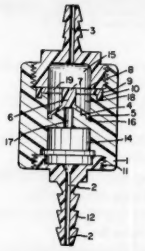
PROCESS FOR TREATMENT OF ASCITES AND DEVICE TO ACCOMPLISH SAME

Harry H. Leveen, 800 Poly Pl., Brooklyn, N.Y. 11209

Filed Oct. 9, 1973, Ser. No. 404,345

Int. Cl.[2] A61M *27/00*

U.S. Cl. 128—350 V **3 Claims**



1. I claim a method for the transfer of body fluids which accumulates in the peritoneum cavity and into the vascular system which comprises passing fluid through a connecting tube into the inlet chamber of a hollow plastic implanted valve, causing that valve to open and passing the fluid under pressure into a second reservoir from where the fluid is conducted through a second section of tubing which tubing is connected to the jugular vein of the patient.

3,910,284

METHOD OF TREATING HUMAN SKIN

Norman Orentreich, 140 E. 72nd St., New York, N.Y. 10021

Filed Jan. 22, 1972, Ser. No. 325,267

Int. Cl. A61b *17/00;* **A61h** *7/00*

U.S. Cl. 128—355 **8 Claims**

1. Method of treating human skin comprising manually rubbing the skin with a soft, resilient, compressible buffing pad comprising a web of hydrophobic fibers which are exposed at the surface of the pad, the web being of such abrasiveness that it can be used manually to remove the stratum disjunctum of the epidermis without significantly disturbing the stratum compactum of the epidermis, and continuing the manual rubbing until said removal of the stratum disjunctum without significantly disturbing the stratum compactum has been effected and, at this point, terminating the rubbing.

3,910,285

BLOWER APPARATUS FOR A COMBINE

Vernon H. Sietmann, Laurel, Iowa, assignor to Beth Keese; Larry Keese, both of Gilman; Wanda Smith and Raymond Smith, both of Laurel, all of, Iowa, part interest to each

Filed May 3, 1973, Ser. No. 356,923

Int. Cl.[2] A01F *14/44*

U.S. Cl. 130—24 **8 Claims**

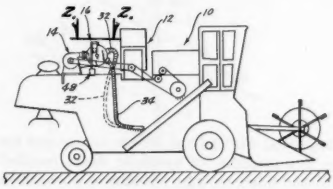
1. In a threshing machine mounted on a wheeled frame and having a housing within which a chaffer unit is conventionally mounted, an apparatus for opposing the lateral gravitational flow of grain over said chaffer unit due to a lateral inclination of the machine relative to a horizontal plane, the apparatus comprising:

blower means mounted on the machine and operable by the machine to pull in air from the atmosphere;

a single valve means comprising a housing and movable valve element within said housing; said housing having an inlet opening connected to said blower for receiving and transmitting air under pressure therefrom, said housing having first and second discharge openings positioned

oppositely from said inlet opening, said housing forming a chamber having a greater cross sectional area than anyone of said inlet and discharge openings whereby said chamber supplies an excess of pressurized air beyond the demand served upon it by said discharge openings; said movable valve element being movable within said housing to open and close said discharge openings;

sensing means connected to said valve element for sensing changes in inclination of said machine and for causing said valve to open and close said discharge openings, said sensing means being directly connected to said valve



element said valve element being immediately responsive to changes in inclination of said machine;

first and second conduits having one end thereof in communication with said first and second discharge openings respectively,

first and second manifold means mounted on the machine on opposite sides of the chaffer unit for directing air across said chaffer unit,

the other ends of said first and second conduits being connected to said first and second manifold means respectively.

3,910,286

HARVESTING MACHINES

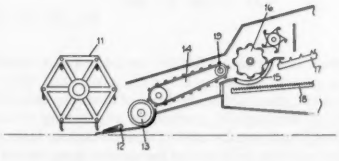
Lancelot Phoenix, Birmingham; John William Euclid Walker, Solihull, and Alan George Mather, Sutton Coldfield, all of England, assignors to Lucas Electrical Company Limited, Birmingham, England

Filed Oct. 5, 1973, Ser. No. 403,889

Claims priority, application United Kingdom, May 10, 1972, 45925/72

Int. Cl.[2] A01F *12/18;* **A01D** *41/12*

U.S. Cl. 130—27 H **3 Claims**



1. A harvesting machine comprising, in combination, a concave and associated cylinder for effecting the required separation of the crop, a rotor for lifting the crop from the ground, an elevator for lifting the crop from the rotor to the cylinder, and means sensitive to the rotational speed of the cylinder for giving a warning or effecting a control in the event that the cylinder and concave are likely to jam including a differentiator to which the speed signal is applied, the differentiator producing an output representing the deceleration of the cylinder, and said means operating when the deceleration of the cylinder exceeds a predetermined value.

3,910,287

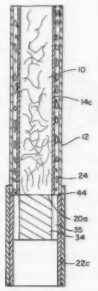
SMOKING DEVICE

Richard R. Walton, Ten W. Hill Pl., Boston, Mass. 02114

Filed Mar. 19, 1971, Ser. No. 126,122

Int. Cl.[2] A24D *01/06*

U.S. Cl. 131—8 R **13 Claims**



1. In a smoking device having an ignition end and a mouthpiece end and including an outer wrapper surrounding an elongated main charge of smoking material, an annular passage defined in part by said outer wrapper to conduct smoke from the burning cone of material directly to the mouthpiece end by-passing the main charge, and control means for limiting the passage of main-stream smoke from the cone through the main charge to the mouthpiece end, the improvement which comprises

means for supporting said outer wrapper at a plurality of spaced areas in such predetermined spaced relationship in transverse direction to the main charge that drawing on the device will cause flame transfer between the main charge and the outer wrapper, carry by-pass smoke through the passage to the mouthpiece end and at the same time hold the outer wrapper against collapsing onto the charge to pinch off the passage,

the outer wrapper being composed of combustible material having a slower burning rate than that of the main charge so that the burning rim of the outer wrapper will extend outwardly at least as far as the burning cone of the charge as smoking progresses such that smoke substantially to the exclusion of ambient air will be drawn down the passage on each draught by the smoker, and

the mutual spacing of said supporting means being uniform and close, whereby the running of the flame down the wrapper is prevented.

3,910,288

PROGRAMMED FILTER

James R. Hammersmith, Jeffersonville, Ind., and Philip H. Cogbill, II, Louisville, Ky., assignors to Brown and Williamson Tobacco Corporation, Louisville, Ky.

Continuation of Ser. No. 336,277, Feb. 27, 1973, abandoned. This application July 5, 1974, Ser. No. 486,021

Int. Cl.[2] A24D *01/04;* **A24F** *07/04*

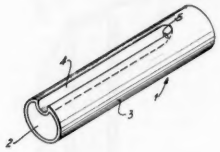
U.S. Cl. 131—10.5 **12 Claims**

1. A filtering element for a smoking product comprising

a. a main filtration element, containing filtration material and having a mouthpiece end, for disposition in substantial alignment with a tobacco section and

b. channel filter means of an initial flow resistance equal to or lower than said main filtration element for causing predetermined proportion of the smoke from the tobacco section to initially by-pass a part of the filtration material and move through said channel filter means and further causing a predetermined increasing proportion of the smoke to pass through said filtration material as the to-

bacco section is smoked, due to increasing flow resistance through said channel filter means, whereby the total particulate matter per puff delivered to the smoker remains essentially constant during smoking of the tobacco section, said channel means including at least one channel having essentially smoke impervious walls, an open upstream end communicating with the tobacco section, and a single orifice at the downstream end of said channel adjacent said filtration material at a position short of the mouthpiece end of said main filtration element, the area of the orifice is from about 0.07 to 6.0mm².



3,910,289

PERMANENT WAVE COMPOSITION FOR HAIR AND PROCESS OF USING IT

Theodor Wajaroff; Eugen Konrad, and Erwin Bettinger, all of Darmstadt, Germany, assignors to Wella AG, Germany

Filed Mar. 9, 1973, Ser. No. 339,941

Claims priority, application Germany, Mar. 21, 1972, 2213671

Int. Cl. A45d *7/00*

U.S. Cl. 132—7 **13 Claims**

1. A hair shaping composition comprising a salt of a mercapto carboxylic acid together with a salt of ascorbic or glyoxylic acid.

3,910,290

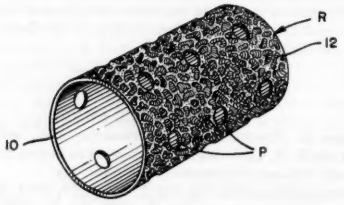
HAIR SETTING ROLLER AND METHOD OF USE

Marvin W. Litman, 8209 Rosewood Drive, Prairie Village, Kans. 66208

Filed Oct. 31, 1973, Ser. No. 411,286

Int. Cl.² A45D *2/02*

U.S. Cl. 132—39 **8 Claims**



1. A reuseable-disposable hair setting roller adapted for repeated applications of a hair treating agent while the hair is being set, comprising a hollow open-ended tube around which strands of hair are wound and temporarily secured, said tube being formed of at least two layers of sheet material, the outer hair contacting layer consisting of an embossed metal foil providing a textured non-absorbent outer surface having a multiplicity of indentations distributed thereover, said tube also including a supporting paperboard layer inwardly of said metal foil layer, and a dry film coating of a water-soluble hair treating agent distributed over said outer surface with thicker portions of said film in said indentations.

3,910,291

ARTIFICIAL HAIR AND METHOD FOR MANUFACTURING THE SAME

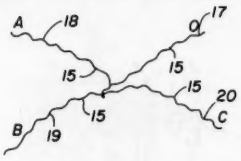
Nak Yang Kim, 19, 197 Eung Am Dong, Seo Dae Mun Gu, Seoul, South Korea (120-03)

Filed Sept. 28, 1973, Ser. No. 401,573

Claims priority, application South Korea, Oct. 2, 1972, 72-1487

Int. Cl.² A41G *3/00*

U.S. Cl. 132—53 **2 Claims**



1. Improved artificial hair for use in wigs and the like comprising a multiplicity of synthetic fibers bundled together, each of said fibers having a plurality of waves of various sizes formed therein ranging in number from about 5 to about 30 waves per inch and extending in various directions, said waves being adapted to facilitate the curling and styling of the hair by bending the fibers in any desired shape or direction along the longitudinal axis of the waves.

3,910,292

HAIR COVERINGS WITH INTERCHANGEABLE COMPONENTS

Michael Izzo, 115 Comino de las Colinas, Redondo Beach, Calif. 90277

Filed Mar. 1, 1974, Ser. No. 447,347

Int. Cl.² A41G *3/00*

U.S. Cl. 132—53 **19 Claims**

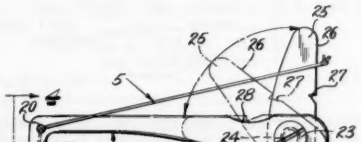
1. A coiffure comprising a flexible clothlike fabric member in the form of a headband and having a size and shape to conform to and to be worn on the head of a wearer, said fabric member being substantially continuous and having an outer surface with no hair strands affixed thereto and an inner surface concealing the natural hair of the wearer from view in the area in which said member overlies the head of the wearer, said fabric member having a first margin generally projecting toward the face portion of the wearer and a second margin generally spaced from the first margin on the fabric, a first band on said fabric member located along one of said margins, a first fiber containing layer on said first band, a wiglet having a second band with hair-like strands secured thereto, and a second fiber containing layer on said second band and being capable of being removably attached to said first band through said fiber containing layers in any of a plurality of positions along said first band, the fibers in said first fiber containing layers being capable of being snugly, but nevertheless removably engageable with the fibers in said second fiber containing

layers, the hairlike strands on the wiglet and the fabric member entirely covering the natural hair of the wearer substantially entirely.

3,910,293
TOOTH CLEANING IMPLEMENT
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Filed Jan. 3, 1974, Ser. No. 430,395
Int. Cl. A61c *15/00*
U.S. Cl. 132—89 **10 Claims**

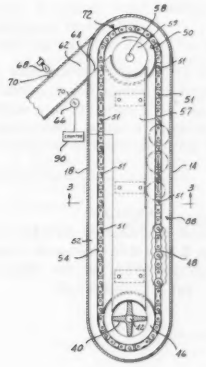
1. A dental implement comprising:
an elongated, substantially straight shank portion,
a head portion integrally formed at one end of said elongated shank portion,
said head portion protruding a short distance outwardly from one side of said shank portion and formed with a tooth cleaning portion thereof which is disposed away from said shank portion, said tooth cleaning portion having an end portion shaped with a single tip defining the outer end thereof,
said head portion having side walls which taper both upwardly towards the upper end of said head to a first edge and downwardly to the lower part of said head portion to a second edge,
said first and second edges of said head portion converging towards each other and extending to said end portion of said head where they join to form said tip and defining a slender, wedge-like end of said head which may be disposed in the crevices between the teeth near the gums and may be employed to remove and clean food lodged between said teeth.

3,910,294
DENTAL FLOSS HOLDER
Dale C. Reed, 1135 W. 186 St., Gardena, Calif. 90247
Filed Apr. 5, 1974, Ser. No. 458,324
Int. Cl.² A61C *15/00*
U.S. Cl. 132—91 **12 Claims**



1. A dental floss holder comprising a pair of relatively rigid elongated leg elements and a hinge means; each leg element being pivotally connected adjacent one end thereof to said hinge means; a pivotal connection between said hinge means and each of said leg elements for permitting said leg elements to be independently and freely pivoted with respect to each other about at least a pair of mutually orthogonal axes; and dental floss retaining means at the distal ends of said leg elements.

3,910,295
BULK-LOADING COIN HOPPER HAVING ENDLESS PIN CHAIN PICKUP
Patrick A. Fletcher, Comstock Park, Mich., assignor to Rowe International Inc., Whippany, N.J.
Filed Jan. 7, 1974, Ser. No. 431,207
Int. Cl.² G07D *9/04*
U.S. Cl. 133—8 R **15 Claims**

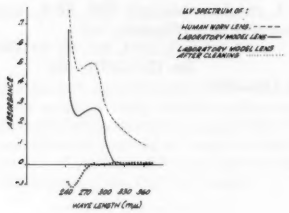


1. A bulk-loading coin hopper for delivering coins one by one from a supply of coins in bulk including in combination, a container for holding a supply of coins in bulk, said container comprising a wall elongated in a direction from the bottom of said container to the top thereof, said wall being inclined at an acute angle to the horizontal in the normal position of the container, means forming a coin discharge opening in said container adjacent to the upper end of said wall, means forming an elongated coin guide channel on the upper surface of said wall, said channel extending in the direction of the length of said wall from a coin pick-up region adjacent to the bottom of said container to said coin delivery opening, said channel adapted to receive coins lying flat, said channel including a linear portion, and means extending upwardly from the base of said channel for receiving coins at said pick-up location and for conveying said coins in spaced relationship upwardly along said channel to said delivery location.

3,910,296
METHOD OF REMOVING PROTEINACEOUS DEPOSITS FROM CONTACT LENSES

Hampar L. Karageozian, Laguna Hills, and Paul Rudko, Huntington Beach, both of Calif., assignors to Allergan Pharmaceuticals, Irvine, Calif.

Continuation-in-part of Ser. No. 352,861, April 20, 1973, abandoned. This application Mar. 4, 1974, Ser. No. 447,744
Int. Cl.[2] B08B 3/08
U.S. Cl. 134—2 12 Claims

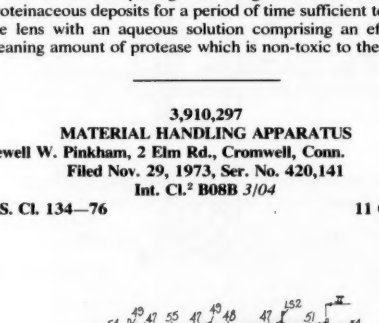


1. A method for removing proteinaceous deposits from contact lenses comprising contacting a contact lens having proteinaceous deposits for a period of time sufficient to clean the lens with an aqueous solution comprising an effective cleaning amount of protease which is non-toxic to the eyes.

3,910,297
MATERIAL HANDLING APPARATUS

Newell W. Pinkham, 2 Elm Rd., Cromwell, Conn.

Filed Nov. 29, 1973, Ser. No. 420,141
Int. Cl.[2] B08B 3/04
U.S. Cl. 134—76 11 Claims

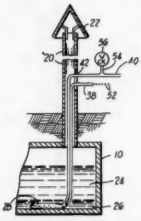


1. An apparatus for conditioning solid materials in a liquid bath comprising a material container, a tank adapted to contain a liquid bath, an open-ended cage having a bottom, sides and top adapted to receive a material container in a position above said tank, means for supporting and moving said cage and container vertically into and out of said tank, said cage being supported for pivotal movement about a horizontal axis no higher than the bottom of the cage, and means carried by said supporting means for rotating said receiving means about said axis.

3,910,298
METHOD OF INSTALLING A WATER REMOVING AND/OR CONTENTS INDICATING DEVICE IN AN EXISTING UNDERGROUND LIQUID FUEL TANK

Albert Shotmeyer, 46 Westerly Road, Saddle River, N.J. 07458

Division of Ser. No. 396,575, Sept. 12, 1973. This application Oct. 16, 1974, Ser. No. 515,293
Int. Cl.[2] F16L 55/12
U.S. Cl. 137—1 7 Claims

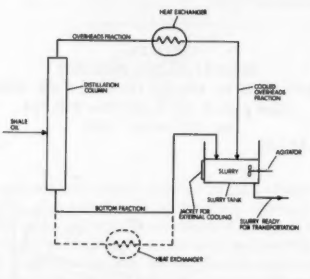


1. A method of installing a crumpable device for removing water from and/or for indicating the contents in an existing underground liquid fuel containing tank having an upstanding vent pipe connected with said tank, said device being structurally independent of said vent pipe and said tank, comprising the steps of: forming an opening in a side wall of said vent pipe above the surface of the ground and remote from said tank; and passing the device in its crumpled state into the tank through said opening and vent pipe into the tank.

3,910,299
TRANSPORTATION OF WAXY HYDROCARBON MIXTURE AS A SLURRY

James E. Tackett, and Paul H. Stewart, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Nov. 15, 1974, Ser. No. 524,008
Int. Cl.[2] F17D 1/16
U.S. Cl. 137—13 17 Claims

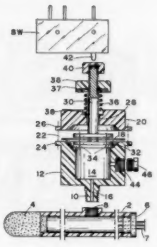


1. A process of transporting and/or storing a waxy hydrocarbon mixture containing 1 to about 80% by weight of wax comprising fractionating the hydrocarbon mixture into at least an overheads fraction and a bottoms fraction (contains at least a majority of the wax), mixing at a shear rate less than about 20 sec^{-1} at least a portion of the overheads fraction which has been cooled to a temperature sufficiently low so that when it is slurried with the bottoms fraction the resulting temperature will be at least below that at which the hydrocarbon mixture will be transported, with at least a major portion of the bottoms fraction which has been heated to a temperature above that at which wax crystallization is effected, to obtain a slurry and thereafter storing or transporting the slurry.

3,910,300
TENSIOMETER AND AUTOMATIC IRRIGATION CONTROL SYSTEM UTILIZING SAME

Aharon Tal, 131 Hanassi St., Herzliya, Israel

Filed Sept. 21, 1973, Ser. No. 399,508
Claims priority, application Israel, Sept. 29, 1972, 40467
Int. Cl.[2] A01G 25/16; F16K 31/165
U.S. Cl. 137—78 8 Claims



1. A tensiometer for measuring soil-moisture tension, comprising:

a tube adapted to contain water and to be inserted into the ground, said tube being closed at one end by a water-permeable body through which the water may pass into and out of the tube in accordance with the soil-moisture tension;

a control member including a housing defining a chamber communicating with the interior of the tube, said chamber being closed by a flexible diaphragm one face of which is exposed to the interior of the chamber so that the diaphragm is deflected inwardly of the chamber upon the presence of a negative pressure in the tube and chamber;

an apertured cap attached to the housing over the opposite face of the diaphragm and clamping the diaphragm between it and the housing, said opposite face of the diaphragm being vented to the atmosphere;

a pair of discs fastened to the central portion of the diaphragm and having an outer diameter smaller than the portion of the diaphragm clamped between the housing and cap;

a stem fastened at its inner end to the discs, the opposite end of the stem being threaded and passing through the aperture in said cap;

a nut threaded on said opposite end of the stem; and

a spring interposed between said nut and said cap and biassing said stem outwardly of the chamber.

3,910,301
ATTITUDE SENSITIVE FUEL VALVE

Ralph L. Kuss, Findlay, Ohio, assignor to R. L. Kuss & Co., Findlay, Ohio

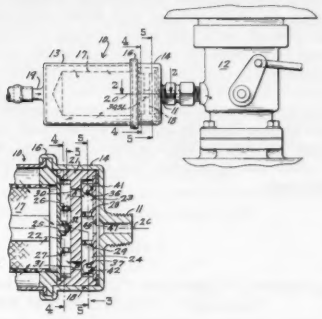
Filed Apr. 8, 1974, Ser. No. 458,690
Int. Cl.[2] F16K 17/36
U.S. Cl. 137—38 6 Claims

1. An attitude sensitive valve, comprising:

a housing defining an upstream inlet fitting and a downstream outlet fitting and having a roll axis;

a first fluid chamber within said housing, said chamber including a first ball and a pair of seats, each effective to receive the ball in response to rotation about a roll axis of the housing and cut off the flow of fluid through the seat;

secondary fluid chambers within said housing, each communicating with the first fluid chamber through a fluid passageway leading to one of the first fluid chamber seats, each secondary chamber having an outwardly disposed ball and an inwardly disposed seat, each of said seats being effective to receive one of said balls to stop the flow of fluid therethrough in response to rotation about the roll axis of the housing; and

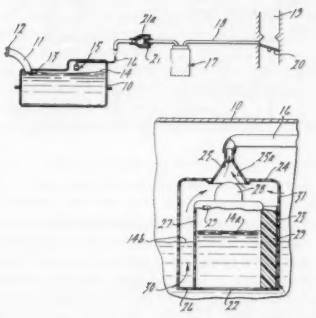


a joint flow passage connecting each of said seats in said secondary fluid chambers with the downstream outlet fitting of the housing.

3,910,302
ROLL-OVER VALVE AND VAPOR SEPARATOR

Gopinath Sudhir, Dearborn, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 14, 1973, Ser. No. 425,023
Int. Cl.[2] F16K 17/36, 31/22
U.S. Cl. 137—43 12 Claims



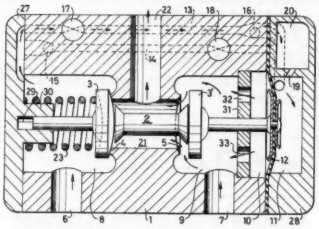
1. Means for preventing liquid fuel from discharging through a vapor vent conduit opening into an upper portion of an automobile fuel tank above the latter's normal fuel level comprising a hollow housing adapted to be supported in said upper portion, said housing having an upper closure portion and depending sidewalls and an unrestricted bottom opening for communicating with said tank, a vent port defined by a valve seat of said closure portion and extending through the latter for connecting said vent conduit with said tank, a hollow valve plunger freely movable within the hollow of said housing, said plunger having an upper closure portion and depending sidewalls and an unrestricted bottom opening aligned with said bottom opening of said housing for freely passing said fuel to and from the hollow interior of said plunger, means spacing said plunger from said housing to maintain said bottom openings substantially in alignment and also to provide a vapor passage between said plunger and housing normally in communication with said vent port, the closure portion of said plunger comprising an upwardly projecting valve element adapted to seat in fluid sealing relationship at said valve seat for closing communication between said tank and vent conduit upon predetermined movement of said plunger toward said valve seat, supporting means for normally supporting said

plunger to maintain said valve element in proximate unseated relationship with said valve seat to enable vapor flow through said vent port from said vapor passage between said housing and plunger, and restricted port means for connecting said vapor passage with said upper portion of said tank, said plunger being floatable upwardly within said housing toward said vent port to close the same when a predetermined amount of vapor is trapped in the upper portion of said hollow plunger by fuel rising therein through its bottom opening and being otherwise non-floatable to move toward said vent port with the fuel flow into the latter bottom opening to close said vent port when said automobile fuel tank inclines to a predetermined angle.

3,910,303
VALVE

Sigge Rydberg, Kopparvagen 57, S-175 72 Jarfalla, Sweden

Filed June 7, 1974, Ser. No. 477,369
Claims priority, application Sweden, June 8, 1973, 7308181; Sept. 25, 1973, 7313017
Int. Cl.[2] F16K *31/365*
U.S. Cl. 137—112 **12 Claims**

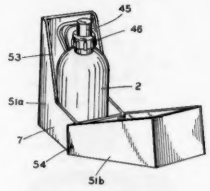


1. A valve comprising a housing having a first inlet for a first pressure medium and a second inlet for a second pressurre medium, said valve being arranged to direct said media alternately to a recipient at selected time intervals, characterized in that said valve further comprises a first chamber connected to the first inlet and a second chamber connected to said second inlet; an axially reciprocatingly movable valve spindle provided with a first valve body and arranged to sealingly abut in a first position of the valve spindle a first valve seat of a passage located between the first chamber and an outlet means and, in a second position of said valve spindle to rest at a distance from the first valve seat, a second valve body arranged to rest, in said first position of said valve spindle, at a distance from a second valve seat of a passage located between the second chamber and the outlet means and, in said second position of said valve spindle, to sealingly abut the second valve seat; a flexible diaphragm arranged to communicate at one side surface thereof with the interior of the second chamber and mounted to the valve spindle and being reciprocatingly movable in the axial direction of said spindle, said diaphragm communicating at its other side surface with a control chamber which is arranged to communicate via a first through-flow passage having a variable control valve means and a second through-flow passage having a second variable control valve means, with the first chamber and in that the first through-flow passage is provided with valve means which permit medium to flow from the first chamber to the control chamber and in that the second through-flow passage is provided with valve means to permit medium to flow from the control chamber to the first chamber.

3,910,304
COMPRESSED AIR SPRAY APPARATUS

John R. Forsberg, Arlington Heights, Ill., assignor to Helene Curtis Industries, Inc., Chicago, Ill.

Division of Ser. No. 334,001, Feb. 20, 1973, abandoned, which is a division of Ser. No. 196,623, Nov. 8, 1971, Pat. No. 3,752,404. This application Jan. 13, 1975, Ser. No. 540,532
Int. Cl.[2] B05B *15/00;* **F16L** *55/14*
U.S. Cl. 137—209 **7 Claims**

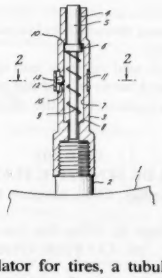


1. In an air-liquid spray system, a replaceable reservoir, a housing for said reservoir having a hinged front cover, said hinge and cover being arranged to cause the bottom edge of the cover to swing under the housing in open position, a flexible air conduit from a source of compressed air passing into the housing and connected to the reservoir, an abutting member in the housing overlying the conduit, and a presser member under the conduit extending under the bottom of the housing and engaged by the front cover in open position to squeeze the conduit between the abutting member and presser member and stop air flow through the conduit.

3,910,305
AIR REGULATOR FOR TIRES

George W. Hughes, 2601 Mills, Houston, Tex. 77026

Filed July 5, 1974, Ser. No. 486,236
Int. Cl.[2] F16K *15/20*
U.S. Cl. 137—224 **1 Claim**

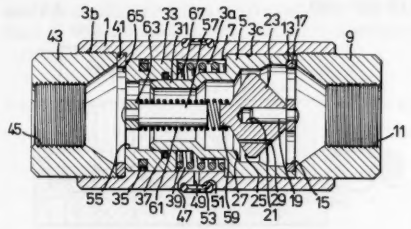


1. In an air regulator for tires, a tubular member to be mounted on the valve stem of a tire, a longitudinal axial air passageway through said member, a plunger mounted in said passageway yieldably maintained in closed position and movable into open position by application of an air hose to the upper end of said tubular member, an orifice in the side wall of said tubular member in communication with said axial air passageway and a valve in said orifice in the side wall of said tubular member consisting of a ball seated in said orifice, an annular groove in said tubular member and a yieldable band mounted in said groove and extended over said ball, a plurality of indentations in the said band of varied depth to permit a selection of pressure level at which said ball will be moved off of said seat to permit excess air to pass through said orifice to the free atmosphere.

3,910,306
SAFETY CUT-OFF VALVE

Karl Gustav Verner Ohrn, Mynthusgatan 35, S-532 00 Skara, Sweden

Filed Nov. 26, 1973, Ser. No. 418,925
Claims priority, application Sweden, Nov. 29, 1972, 15572/72
Int. Cl.[2] F16K *17/24*
U.S. Cl. 137—498 11 Claims



1. A safety cut-off valve adapted to close automatically in case of loss of pressure within a supervised portion of a closed system making use of a pressure fluid to actuate a motor, the cut-off valve being connected between a source of pressure fluid and the motor and being adapted to close automatically in case of a breakage within the supervised portion of the system comprising a valve housing having one connection to the supervised portion of the system and a second connection to receive the fluid under pressure, said connections being interconnected through the valve housing by a normally open flow passage, a valve seat in the flow passage, a valve part in the flow passage between the seat and the second connection which valve part is urged by the flow of fluid under pressure through the passage toward the valve seat; means to hold said valve part off of said seat during normal operation, said means including a first spring and a plunger member in the flow passage, said plunger having one end facing said one connection, said one end of said plunger member being exposed to the pressure fluid in the passage and supervised portion of the system to be moved under the influence of the normal operating pressure thereof to a first position, said plunger member including a valve engaging element movable therewith for positively holding the valve part away from its seat when said plunger member is in said first position; a second spring for urging the plunger member to move in a direction opposite to the movement that takes place under normal operation, said second spring effecting movement of the plunger member away from said first position to a second position when a sub-normal pressure prevails in said supervised portion of the system and the passageway at said first connection, and said valve engaging element being moved with the plunger member as it moves to said second position to release its hold on the valve part to allow the valve part to seal against its seat under the urging of the flow of fluid under pressure through said second connection into the passageway.

3,910,307
QUICK DISCONNECT FILTER COUPLING

Fred Jankowski, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 30, 1974, Ser. No. 474,745
Int. Cl.[2] F16L *29/00*
U.S. Cl. 137—515.3 1 Claim

1. A quick disconnect filter coupling for selectively connecting and disconnecting a pair of fluid carrying lines together comprising:

a male cylindrical housing having an enlarged longitudinal bore therein;

one of said lines being connected to one end of said male cylindrical housing;

a filter cartridge carried within said longitudinal bore and being coextensive in length with said longitudinal bore and threadedly removable therefrom;

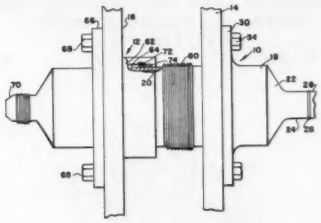
said filter cartridge including an elongated housing;

an elongated bore extending through said housing through which fluid flows;

said elongated bore having a filter receiving compartment adjacent the inner end of said elongated housing;

a filter medium carried in said compartment for filtering said fluid flowing through said cartridge;

a retainer cap threaded onto said inner end of said housing for securing said filter in said compartment;



a check valve carried in said elongated bore adjacent the outer end of said elongated housing for permitting the passage of fluid in one direction;

a tapered interior exit portion at the inner end of said male cylindrical housing merging with the inner end of said longitudinal bore thereof adapted for receiving a tapered seal of a purge assembly;

external threads carried on said male cylindrical housing whereby a purge assembly may be alternately attached to said male cylindrical housing; and

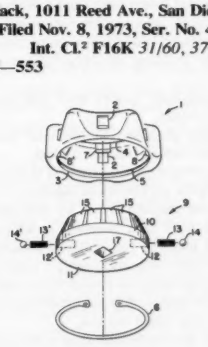
a female cylindrical housing having an enlarged longitudinal bore;

said male cylindrical housing having an external diameter smaller than an internal diameter of said female cylindrical housing so that said male housing with said filter cartridge therein can be inserted in said female housing.

3,910,308
SIGNAL HANDLE FOR VALVES

Phillip R. Mack, 1011 Reed Ave., San Diego, Calif. 92109

Filed Nov. 8, 1973, Ser. No. 414,162
Int. Cl.[2] F16K *31/60*, *37/00*
U.S. Cl. 137—553 7 Claims



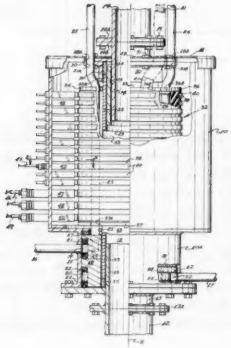
1. In a handle for the stem of a valve which simultaneously opens and closes said valve and indicates the open and closed position of said valve, the combination of an outer handle member provided with window means and having an interior recess to receive an inner member bearing indicia visible through said window means and mounted within said outer

member and having at least one biased locking member on its outer surface to engage a like number of recesses on the inner wall of said outer member after a limited rotation of said outer member about said inner member whereby the inner and outer members rotate as a unit, means on the inner member for affixing the inner member to the valve stem in non-rotating relationship and abutting means on the inner member engaging stop means on the inner surface of the outer member after said limited rotation whereby said rotation of the outer member will expose, through said window means, one indicia when the valve is open and different indicia when the valve is closed.

3,910,309
ROTATABLE COUPLING FOR FLUID AND ELECTRICAL SERVICES

Heinz W. Kaiser, Rt. 1, Box 248, Eugene, Oreg. 97404

Filed Apr. 8, 1974, Ser. No. 458,597
Int. Cl.[2] F16L *27/08*
U.S. Cl. 137—580 **4 Claims**



1. A multiple purpose coupling a unitary nature interconnecting moving and stationary electrical, water and waste conduit components to provide services to a rotatable building structure, said coupling comprising,

axially aligned upper and lower waste conduits having interengaging end segments adapted for rotational movement relative to one another, said upper waste conduit being rotatable with said building structure about a common axis,

A stationary housing radially spaced from and supported by said lower waste conduit,

a drum concentrically disposed within said housing and depending from said upper waste conduit,

electrical conductor means carried by said stationary housing and in circuit with an electrical source,

cooperating conductor means carried by said drum and in continuous circuit with said housing conductor means and with electrical leads to the building structure,

said housing also in communication with a water source,

a water collector ring movably mounted within said housing and defining annular water charged chambers receiving a water supply from the water source,

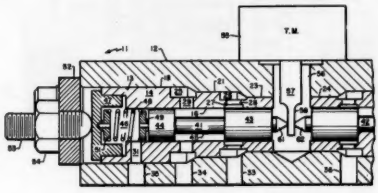
water conduit means in continuous upstream communication with the chambers in said collector ring, said conduit means routed upwardly through said drum along a course intermediate the lower waste conduit and the exterior of said drum, and

said electrical leads and water conduit means exiting the upper end of said housing in proximity to the upper waste conduit for rotation therewith in a compact manner and with the building structure to communicate their respective services to said structure.

3,910,310
CYLINDER AND PISTON PILOT VALVE SYSTEM

Paul F. Hayner, Lexington, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Sept. 26, 1973, Ser. No. 400,751
Int. Cl. F16k *31/02;* **F15b** *13/043*
U.S. Cl. 137—595 **5 Claims**



3. A valve system including a valve housing formed to define a hollow cylinder and a plurality of generally radial passageways each providing communication between the interior of said cylinder and the exterior of said housing, first and second pistons disposed in said cylinder and each including a plurality of lands located for cooperation with said passageways to define a reference position at which communication among said passageways is blocked, a torque motor responsive to an input signal and including an actuating arm formed to define a finger which extends between adjacent ends of said pistons for displacing said pistons from said reference position so as to establish communication between selected ones of said passageways, and first and second springs acting between said housing and said first and second pistons respectively for urging said pistons toward each other and toward engagement with said finger,

characterized in that said housing includes a valve body formed to define a generally cylindrical chamber and also includes first and second generally cylindrical sleeves disposed within said chamber in axial alignment with each other and in sliding engagement with the interior surface of said chamber and together defining said hollow cylinder in which said pistons are disposed and in which said passageways in said housing comprise registering passageways in said body and said sleeves each communicating with the exterior of said body, with said chamber, and with said hollow cylinder and in which said chamber and said sleeves are formed to define enlarged diameter portions at opposite ends and reduced diameter portions inwardly thereof with each junction between enlarged and reduced diameter portions communicating with one of said passageways, whereby the presence of fluid under pressure in such passageways urges said sleeves outwardly away from each other, and which includes means for adjustably limiting the movement of each of said sleeves resulting from said urging.

4. A valve system including a valve housing formed to define a hollow cylinder and a plurality of generally radial passageways each providing communication between the interior of said cylinder and the exterior of said housing, first and second pistons disposed in said cylinder and each including a plurality of lands located for cooperation with said passageways to define a reference position at which communication among said passageways is blocked, a torque motor responsive to an input signal and including an actuating arm formed to define a finger which extends between adjacent ends of said pistons for displacing said pistons from said reference position so as to establish communication between selected ones of said passageways, and first and second springs acting between said housing and said first and second pistons respectively for

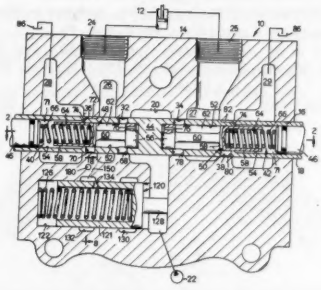
urging said pistons toward each other and toward engagement with said finger,

characterized in that said system includes first and second adjusting screws positioned at adjacent ends of said first and second pistons respectively, and protruding therefrom and engaging opposite sides of said finger, whereby adjustment of said screws adjusts the relative positions of said lands and said passageways.

3,910,311
PRESSURE COMPENSATED CONTROL VALVE

Raud A. Wilke, Brookfield, Wis., assignor to Koehring Company, Milwaukee, Wis.

Filed Aug. 26, 1974, Ser. No. 500,747
Int. Cl.² F16K *11/00*
U.S. Cl. 137—596 **20 Claims**



6. A control valve comprising, a housing having a fluid inlet, a pair of fluid service passages and a fluid return passage, a valve member in said housing shiftable in opposite directions from a neutral position isolating said inlet from both said service and return passages toward one or the other of a pair of operating positions in which said inlet communicates with a selected one of said service passages and the other of said service passages communicates with said return passage, a pair of chambers formed in said control valve member and being isolated from each other, said valve member including means to direct fluid flow from said inlet through one of said pair of chambers to one of said service passages serially through first and second control openings and from the other of said service passages through the other of said pair of chambers to said return passage serially through third and fourth control openings, the size of said second and fourth control openings being determined by the extent of movement of said valve member from its said neutral position towards one of said operating positions, a pair of pressure compensating means disposed in said pair of chambers, respectively, and each having a pressure responsive portion for automatically decreasing the size of said first and third openings to decrease the pressure in said chambers in response to an increase in pressure differential between one of said chambers and said service ports through said second opening and between the other of said chambers and said return port through said fourth opening.

3,910,312
COUPLING FOR PRESSURE CONDUITS

Karl Weinhold, Im Jagdfeld 43, D-404 Neuss, Germany

Filed Apr. 22, 1974, Ser. No. 463,035
Int. Cl.² F16L *37/00*
U.S. Cl. 137—614.03 **9 Claims**

1. A coupling for pressure conduits including

a. a pair of coupling members, each of said coupling members having

b. a main valve therein, said main valves each being adapted to be opened by abutment with

c. an opening member on the opposite valve, a first of said main valves having

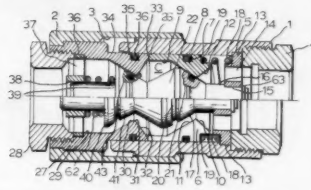
d. an axial transfer bore therethrough,

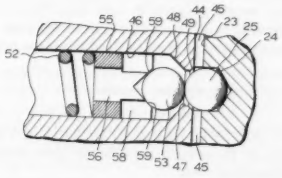
e. a pressure-transfer valve within said transfer bore, said pressure transfer valve including within said transfer bore

f. a ball valve member,

g. a conical valve seat and

h. a spring, said spring being adapted to bias said ball against said valve seat,





i. abutment means on said other main valve for unseating said ball immediately prior to full joining of said coupling,

j. said main valves each including a face, said faces being adapted to abut each other,

k. said axial transfer bore terminating in an outwardly tapered bore portion at said face of said first main valve, and

l. said abutment means including a spherical opening member on the face of the other main valve and aligned with said outwardly tapered bore portion, said spherical opening member being of a size less than that which would obstruct said outwardly tapered bore portion.

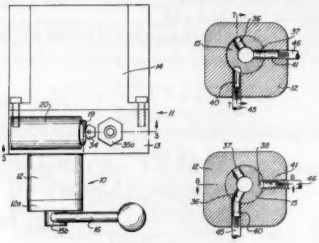
3,910,313
HYDRAULIC VALVE UNIT

Randy J. Nordell, Salt Lake City, Utah, assignor to Time Commerical Financing Corporation, Salt Lake City, Utah

Division of Ser. No. 367,713, June 7, 1973, Pat. No. 3,824,043.
This application May 13, 1974, Ser. No. 469,462
Int. Cl.² F16K *11/085*
U.S. Cl. 137—625.23 **2 Claims**

1. A valve for use in controlling fluid flow between a source of hydraulic fluid and a hydraulically operated device, comprising a valve body; a cylindrical valve spool rotatably mounted within said valve body and having an axial bore extending thereinto from one end thereof serving as an inlet for pressurized hydraulic fluid from a source of same; one or more flow passages extending transversely through said valve spool from flow communication with said axial bore to flow communication with the cylindrical surface of the valve spool; a pair of ports circumferentially spaced in said valve body, positioned to independently register with said flow passage of the valve spool and to be in independent flow communication with a hydraulically powered device; a partial or completely circumferential groove formed in the cylindrical surface of the valve spool in longitudinally spaced relationship with said flow passage of the valve spool; an exhaust port in said valve body

positioned to register with said circumferential groove; a longitudinal groove in the cylindrical surface of said valve spool and connecting with said circumferential groove; means for rotating the valve spool from a position in which one of said flow pssages that is in communication with the axial bore is in registry with one of said pair of ports in the valve body



and the longitudinal groove is in registry with the other of said pair of ports, to a position in which the registries are reversed; and check valve means located in said axial bore to allow pressurized hydraulic fluid from said source of same to flow into the bore, but to prevent flow of fluid from the bore back to said source.

3,910,314

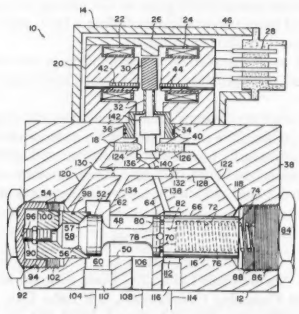
HIGH-SPEED SHUTOFF AND DUMP VALVE

Robert D. Nicholson, Birmingham, Mich., assignor to Koehring Company, Milwaukee, Wis.

Filed Aug. 16, 1973, Ser. No. 388,897

Int. Cl.[2] F16K *11/07*

U.S. Cl. 137—625.62 **19 Claims**



1. High-speed valve structure comprising a valve body having passages therein for passage of fluid therethrough, means for metering fluid through the passages in the valve body including a valve member in one of the passages movable between an open and a closed position, and means within the valve body and operably associated with the valve member responsive to initial movement of the valve member toward a closed position for regeneratively increasing the acceleration rate of the valve member toward the closed position.

11. High-speed valve structure comprising a valve body having passages therein for passage of fluid therethrough, means for metering fluid through the passages in the valve body including a spool valve member in one of the passages movable between an open and closed position, and means within the valve body and operably associated with the valve member responsive to initial movement of the valve member toward a closed position for regeneratively increasing the acceleration rate of the valve member toward the closed position comprising means within the valve body and operatively associated with the valve member for increasing the pressure on the one portion of the valve member tending to move the valve member toward the closed position comprising a valve seat positioned adjacent one end of the valve member and in sealing engagement therewith with the valve member in an open position, which valve seat has a recess in one side thereof opening toward the one end of the valve member and a chamber open to fluid pressure into the valve structure surrounding the one end of the valve member and receiving the one side of the valve seat whereby on initial movement of the one end of the valve member toward a closed position the fluid pressure in is provided in the recess to act against the one end of the valve member and provide pressure on the one end of the valve member related to the opening between the one end of the valve member and the valve seat.

3,910,315

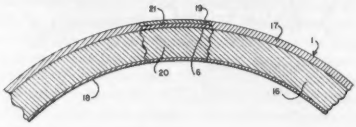
ELECTRICAL METALLIC TUBING

Samuel L. Norteman, Wheeling, W. Va., assignor to Wheeling-Pittsburgh Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 265,607, June 23, 1973, Pat. No. 3,827,139. This application Apr. 19, 1974, Ser. No. 462,430

Int. Cl.[2] F16L *9/00, 9/14*

U.S. Cl. 138—145 **2 Claims**



1. Electrical metallic tubing comprising welded steel tubing having an outer coating of zinc in contact with the steel tubing except over the outer surface of the weld area and over that surface only an aluminum coating in contact with the steel tubing and a zinc coating superimposed directly on the aluminum coating.

3,910,316

DOUBLE-WORM EXTRUDER HOUSING

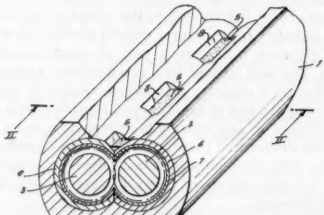
Hans Reifenhauser, Troisdorf, Germany, assignor to Reifenhauser KG, Troisdorf, Germany

Filed June 20, 1973, Ser. No. 371,849

Claims priority, application Germany, June 24, 1972, 2231046

Int. Cl.[2] B29F *3/04*; F16L *9/18*

U.S. Cl. 138—171 **2 Claims**



1. An housing for a double-worm extruder comprising:

an outer casing formed with a longitudinal passage having the shape of a pair of intersecting parallel cylinders; and an internally faced liner snugly received in said passage by thermally fitting said liner into said casing, said liner including:

a pair of complementary internally faced tube segments joined together along a common chord plane at two

opposite seams longitudinally extending along said liner, said internally faced segments having juxtaposed planar surfaces abutting one another and of full thickness in spaced relation along said seams, said segments being formed externally at said chord plane with longitudinally spaced notches alternating with said abutting surfaces of full thickness and defining abutting regions of reduced thickness, and

a fillet weldment in each of said notches, said notches to the one side of said liner being staggered relative to the notches on the other side,

said notches being spaced longitudinally apart by a distance generally equal to their longitudinal lengths, the notches being formed by angularly adjoining bevels at the outer edges of the respective abutting surfaces.

3,910,317
WEAVING MACHINE FOR TERRY CLOTH

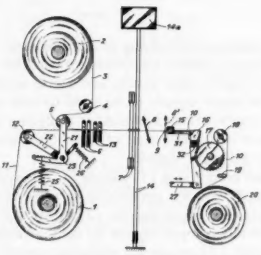
Eberhard Seifert, Sulz-Attikon, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 24, 1973, Ser. No. 354,071

Claims priority, application Switzerland, Apr. 24, 1972, 6026/72

Int. Cl.² D03D *49/06, 39/22, 51/20*

U.S. Cl. 139—102 **5 Claims**



1. In a weaving machine for terry cloth having pile loops and woven in a predetermined weaving plane,

a pile warp beam for supplying pile warps to a shed;

a ground warp beam above said pile warp beam and the weaving plane for supplying ground warps to said shed;

a plurality of detector slats of a warp stop motion in the weaving plane for passage of the respective warps therethrough;

a tensioning beam disposed below said ground warp beam and above the weaving plane to guide the ground warps into the weaving plane, said tensioning beam being movable transversely of the ground warps; and

a deflecting means between said ground warp beam and said tensioning beam for guiding the ground warps therebetween, said deflecting means being positioned closer to said shed than said tensioning beam and being spaced from said tensioning beam to define an access space for manual entry to said detector slats whereby upon stopping of said weaving machine access can be made to said detector slats by moving the ground warps aside between said tensioning beam and said deflecting means without pulling out the pile loops.

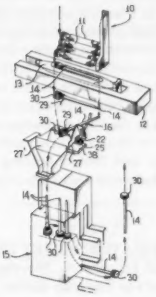
3,910,318
EMPTY QUILL DEFLECTOR AND GUIDE FOR LOOM FILLING WINDER

James T. Blakely, Laurens, S.C., assignor to Blakely Industries, Greenville, S.C.

Filed Aug. 12, 1974, Ser. No. 496,884

Int. Cl.² D03J *1/04*

U.S. Cl. 139—262 **4 Claims**



1. A deflector and guidance unit for ejected spent quills in an automatic loom filling winder comprising a mounting bracket attachable in fixed relation to a solid structural part of said filling winder, and an elongated spring-like quill deflector element attached solidly to said mounting bracket and projecting therefrom into the path of falling ejected quills and contacting such quills for the purpose of directing them butt end first into a stripper mechanism of an automatic loom filling winder, said deflector element formed of a tough durable resilient plastic, and said mounting bracket comprising an L-shaped bracket having a base web attachable to a horizontal tray of a stripper chute on an automatic loom filling winder and an upstanding right angular web having an aperture, said plastic deflector element having a slot in its base end and said slot adapted to register with said aperture, and a clamping bolt means engageable through said slotted aperture to fixedly secure the deflector element adjustably to said bracket.

3,910,319
FABRIC COLLECTING MEANS FOR POWER LOOMS

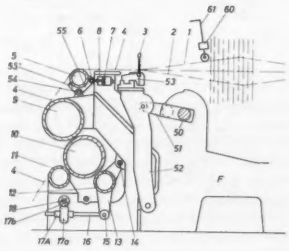
Friedrich Wilhelm Bassing, and Gerhard Hofmann, both of Hamburg, Germany, assignors to Alfa-Laval Bergedorfer Eisenwerke GmbH, Hamburg, Germany

Filed May 17, 1974, Ser. No. 470,505

Claims priority, application Germany, May 22, 1973, 2325908

Int. Cl.² D03D *49/20*

U.S. Cl. 139—308 **23 Claims**



1. In a power loom, means for collecting woven fabric which is obtained by interweaving warp threads with filling threads,

comprising a first rotary collecting beam; a second rotary collecting beam adjacent to and parallel with said first collecting beam and forming a nip therewith; first and second additional beams parallel with said first collecting beam and supporting said second collecting beam, the fabric being trained over said first collecting beam, passed through said nip of said first and second collecting beams, thereupon over said second collecting beam and finally over said first additional beam; means for rotating said first and second collecting beams in opposite directions to thereby advance said fabric towards said first additional beam, said means for rotating including a drive for rotating said second collecting beam independent of the position and the movement of said second collecting beam with respect to said first collecting beam; and means for moving one of said additional beams independently of the other of said additional beams in directions toward and away from said first collecting beam to thereby move said second collecting beam with respect to said first collecting beam and to thus change the distance between said collecting beams.

3,910,320

TOW DEWATERING JET DEVICE

Donald L. Finley, and Edward A. Morehead, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 257,406, May 26, 1972, Pat. No. 3,786,574. This application Dec. 13, 1973, Ser. No. 424,518

Int. Cl.[2] F26B *5/14;* **B05B** *1/04, 1/20, 13/00*

U.S. Cl. 239—597 **2 Claims**

1. An improved dewatering jet comprising a cylindrical hollow member of predetermined length and defining through the wall of the member a slot-like opening extending over a portion of the length of the member and having substantially parallel walls and a depth to width ratio of about 5:1 and a radius on the outer lips of the opening of about 1/32 inch.

3,910,321

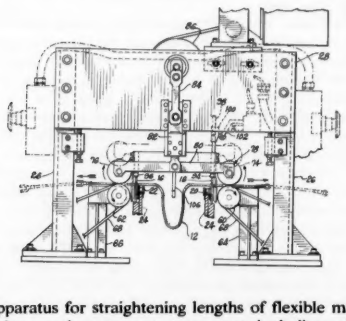
STRAIGHTENING APPARATUS

Carl McKeever, Kendallville, Ind., assignor to Lyall Electric, Inc., Albion, Ind.

Filed Sept. 9, 1974, Ser. No. 504,344

Int. Cl.[2] B21F *1/02*

U.S. Cl. 140—147 **15 Claims**



1. Apparatus for straightening lengths of flexible material comprising an elongate conveyor means including gripping means to grip lengths of flexible material, a pair of spaced driven rollers mounted adjacent to the conveyor means, a pair of corresponding rollers mounted above the driven rollers, said pair of corresponding rollers adapted to be displaced toward the driven rollers to engage the ends of the length of flexible material and means to displace said pair of corresponding rollers toward the driven rollers to engage the ends of the length of flexible material therebetween whereby ends of the length of flexible material are drawn outwardly between the rollers to draw taut the length of flexible material.

3,910,322

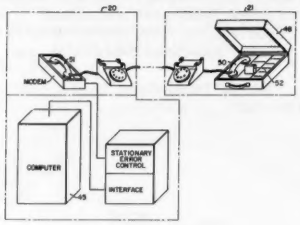
TEST SET CONTROLLED BY A REMOTELY POSITIONED DIGITAL COMPUTER

Samuel J. Hardesty, Jr., Linthicum, and Harvey M. Masters, Ellicott City, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 24, 1972, Ser. No. 283,452

Int. Cl.[2] H04L *1/00;* **G08C** *25/02;* **H03K** *5/18, 13/32*

U.S. Cl. 340—172.5 **4 Claims**



1. A test system, comprising in combination:

a. a computer facility comprising means for generating a series of digital data words, said words specifying predetermined input signals to be used to test remotely positioned equipment and means for analyzing sample signals indicative of the response of said equipment to said predetermined input signals;

b. a test set comprising (1) means for receiving said digital data words and for generating in response thereto said predetermined input signals, (2) means for coupling said predetermined input signals to said remotely positioned equipment, (3) means for sampling signals produced by said equipment in response to said predetermined input signals to generate said sample signals; and

c. communication apparatus comprising first and second stations coupling said computer and said test set via a full duplex channel, said first station being positioned at said conputer and said second station being positioned at said test set, each of said stations including error correction means comprising:

1. a field code generator for generating and assigning a sequential field code to each of said digital data words at the point where said digital data words originate to form a data signal:

2. start code detector and temporary storage circuitry to detect when a data signal originating at the other station is being received and for storing a predetermined number of said data words and their associated field code;

3. data retransmitting means for transmitting the received digital data signal to the originating station;

4. compare means for comparing the retransmitted digital data signal to the original digital data signal on a bit by bit basis with any difference between these signals indicating a transmission error;

5. means for retransmitting any digital data signal found to contain errors without interrupting the data stream from the transmitting to the receiving station; and

6. means for checking the sequence of the field codes associated with each of said data words as they are received by the receiving station to determine if the

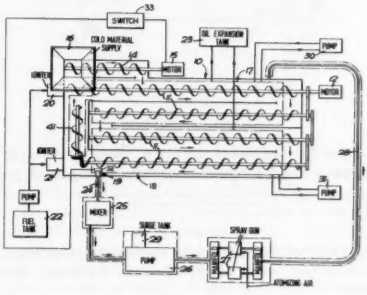
associated data word is being retransmitted because of transmission errors and for outputting data words from said temporary storage when the stored data word has been verified as correct by checking the sequence of field codes arriving at said stations.

3,910,323

METHOD AND APPARATUS FOR SPRAYING LIQUID MATERIAL

John Harding, and Peter Placzek, both of Crawley, England, assignors to Prismo Universal Limited, Crawley, England

Filed Apr. 5, 1974, Ser. No. 458,268
Int. Cl.² B65B *3/04*
U.S. Cl. 141—2 **18 Claims**



1. A method of feeding liquid material to be sprayed to at least one spray gun, comprising:

a. feeding solid material into an endless conveying path,

b. circulating or allowing the material to circulate around said path,

c. heating the material as it circulates until at least a part of the material is liquefied and raised to a predetermined temperature,

d. discharging at least a portion of said part of the hot liquefied material from the conveying path as a feed for at least one spray gun, and

e. feeding an equivalent amount of further solid material into the conveying path.

3,910,324

ROTARY ENTRY FASTENER DRIVING TOOL

John R. Nasiatka, Northbrook, Ill., assignor to Duo-Fast Corporation, Franklin Park, Ill.

Filed Apr. 29, 1974, Ser. No. 464,914
Int. Cl.² B25B *23/04;* **B65D** *85/24*
U.S. Cl. 144—32 **19 Claims**

4. In combination:

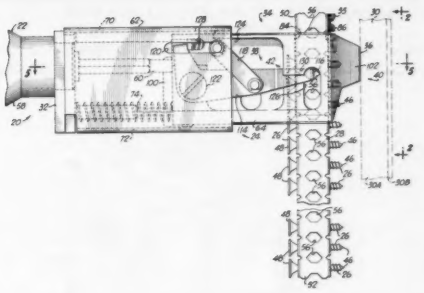
a fastener having a head and a shank;

holding means for frictionally and releasably supporting said fastener in a predetermined drive position;

a drive member axially aligned with said fastener in said drive position and movable through a drive stroke through said drive position for releasing said fastener from said holding means;

bit means on said drive member engageable with said head to effect driving of said fastener, said bit means and said head cooperating to prevent lateral movement of said head relative to said bit means and to urge said fastener into axial alignment with said drive member; and

spacer means for preventing the engagement of said fastener with a workpiece until after said shank is released from said holding means.

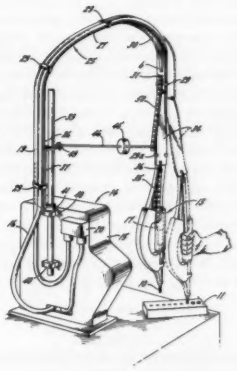


3,910,325

AUTOMATIC FASTENER DRIVING MACHINE WITH HAND-HELD DRIVING GUN

Paul H. Dixon, Belvidere, Ill., assignor to Dixon Automatic Tool, Inc., Rockford, Ill.

Filed Nov. 4, 1974, Ser. No. 520,236
Int. Cl.² B25B *15/00*
U.S. Cl. 144—32 **5 Claims**

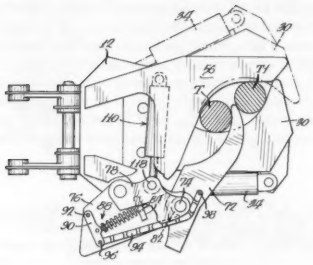


2. A machine having a fixed support and having a hand-held tool, a flexible line extending between said support and said tool, and means for supporting said line while suspending said tool for up and down movement, said means comprising a resiliently yieldable leaf spring having a lower section extending upwardly from said support and having an upper section which arches upwardly, outwardly and then downwardly toward said tool, said line being strung along and supported by said spring, the upper section of said spring defining a vertically resilient cantilever and exerting an upward bias on said tool to enable the tool to be pulled manually downwardly and then automatically returned upwardly upon removal of the downward manual force.

3,910,326
TREE HARVESTING APPARATUS WITH ACCUMULATOR MECHANISM

Frank J. Tucek, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 29, 1974, Ser. No. 518,771
Int. Cl.[2] A01G *23/08;* F15B *15/02*
U.S. Cl. 144—34 R 10 Claims



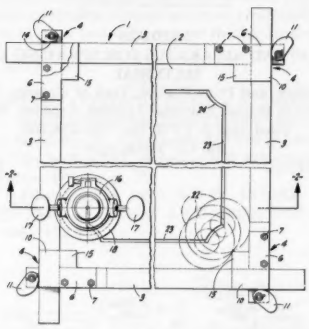
1. In combination with a tree harvesting apparatus including support means adapted to be supported on the outer end of a boom, grapple means on said support mean for grasping a standing tree, cutter means on said support means for severing said standing tree, and tree accumulator means pivotally supported on said support means for accumulating a plurality of trees on said support means, a hydraulic control system for said apparatus, said control system including first hydraulic motor means cooperating with said grapple means, second hydraulic motor means cooperating with said cutter means, third hydraulic motor means cooperating with said accumulator means, a fluid reservoir, a pump connected to said reservoir for supplying fluid under pressure, first and second main conduits respectively leading from said reservoir and said pump to said support means and connected directly to said first and second hydraulic motor means, control valve means in said first and second main conduits remote from said support means, first and second branch conduits connected to said third hydraulic motor means to said first and second main conduits adjacent said support means, and remotely controlled solenoid valve means adjacent said support in said first and second branch conduits for controlling flow between said main conduits and said third hydraulic motor means.

3,910,327
WORK-HOLDING ROUTER GUIDE

Harry R. Heckenlaible, 2086 Webb St., Stockton, Calif. 95205

Filed Mar. 10, 1975, Ser. No. 557,019
Int. Cl.[2] B27C *5/04*
U.S. Cl. 144—136 R 9 Claims

1. A work-holding router guide comprising a size-adjustable frame adapted to surround a work piece in peripheral engagement, the frame including border and guide bars which are edge-exposed above the top surface of the work piece, and bar-clamping units adjustably connecting the bars at adjacent ends; said units including releasable clamping means to maintain the bars in selected positions of adjustment, and templates associated with the bar-clamping units and overhanging the corners of the work piece; the guide being adapted for use with a portable, hand-manipulated router, the router being supported by the work piece and having a driven groove-cutting bit depending into the said work piece; a guide bar and template follower, and means mounting the follower on the router in position for successive engagement in guided relation with the exposed edges of the guide bars and the templates upon progressive movement of the router on the work

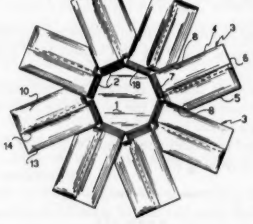


piece within the confines of the frame, whereby the router bit cuts a groove of predetermined pattern in such work piece.

3,910,328
INSULATING JACKET FOR DRINKING UTENSILS

Emery Marcoux, 445a Fleury St. East, Montreal, Quebec, Canada

Filed Oct. 1, 1973, Ser. No. 402,349
Int. Cl. B65b *11/48;* B65d *81/04*
U.S. Cl. 150—52 9 Claims

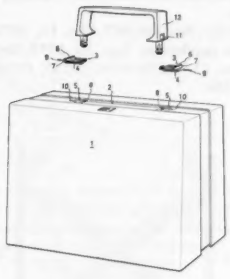


1. A jacket for use with drinking utensils and made of heat insulating material comprising a bottom having the shape of a regular polygon, a side wall composed of a plurality of separate side wall elements, each independently hinged to a straight side edge of said polygonal bottom, each side wall element of an elongated shape, said side wall elements capable of taking an inclined as well as a perpendicular position with respect to the bottom to substantially fit tapered as well as non-tapered drinking utensils, each side wall element further being of generally rectangular shape and formed of two longitudinal sections disposed side by side and offset one with respect to the other across their thickness, one section only being hinged to the bottom and the other section laterally extending from said hinged section, said side wall elements overlapping each other in their upright condition.

3,910,329
SEWING MACHINE CASE

Hannes Giesselmann, Huskvarna, Sweden, assignor to Husqvarna AB, Huskvarna, Sweden

Filed Mar. 15, 1974, Ser. No. 451,704
Claims priority, application Sweden, Mar. 16, 1973, 73036949
Int. Cl.² B65D 65/02
U.S. Cl. 150—52 R 2 Claims

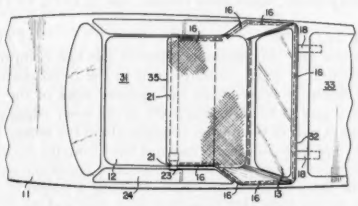


1. A sewing machine case having an open lower end and provided with a rectangular hole situated on the topside of the case with space for a handle arranged on the sewing machine, at each end of the hole there being located a guideway and a locking lip displaceable in said guideway in the longitudinal direction of the hole, a spring acting upon said lip in the direction toward the center of said hole, said handle having outer end surfaces each of which is provided with a recess for receiving said locking lips, wherein the locking lips, when the handle enters into the hole, slip on said end surfaces and are displaced away from the handle against the bias of the spring and snap into said recesses, when the case is put on the sewing machine with the handle completely in said hole.

3,910,330
PORTABLE VINYL AUTO TOP COVER

Dennis A. Johnson, and Samuel C. Johnson, both of Detroit, Mich., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 4, 1974, Ser. No. 439,417
Int. Cl.² B60J 11/00
U.S. Cl. 150—52 K 3 Claims

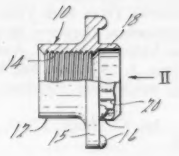


1. An automobile roof cover formed of a composite structure of an exterior sheet of vinyl plastic material bonded to a soft undercover material with strapping fastened to the underside of the roof cover, said strapping having magnetic attraction characteristics for fastening the cover to the steel roof of an automobile.

3,910,331
NUT

Robert H. Randall, Fullerton, Calif., assignor to Kaynar Mfg. Co., Inc., Fullerton, Calif.

Filed Aug. 12, 1974, Ser. No. 496,726
Int. Cl.² F16B 37/00
U.S. Cl. 151—41.72 3 Claims

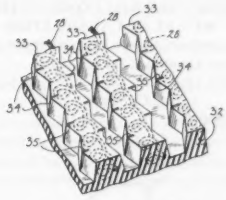


1. A nut or the like adapted to be clinched to a workpiece, said nut having a flange lying in a plane substantially perpendicular to its axis and a plurality of projections on one face of the flange, said projections extending in an axial direction, characterized by workpiece-engaging portions all of which are smoothly contoured, including integral projections having generally spheroidal ends formed of relatively hard material whereby deformation of a workpiece by said projections does not create sharp angles in the surface of the workpiece, a swagable securing collar extending axially from the flange in the same direction as the projections and coaxially with the nut, said collar having radially directed recesses in its outer surface facing said projections and having smoothly rounded surfaces, the radially outer portions of said recesses being smoothly flared, whereby material displaced by the projections may flow into the recesses without being shaped to sharply angled contours.

3,910,332
ART OF FORMING TIRE TREADS WITH ELONGATED TRACTION-AUGMENTING ELEMENTS

Paul J. Felker, Marshfield, Wis., assignor to Penetred Corporation, Marshfield, Wis.

Division of Ser. No. 20,356, March 17, 1970, Pat. No. 3,872,207. This application Feb. 14, 1974, Ser. No. 442,526
Int. Cl.² B60C 11/16
U.S. Cl. 152—211 1 Claim



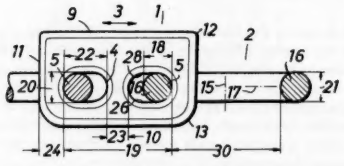
1. In a tire having a rubber tread portion with lateraly-spaced, circumferentially-extending rider strips, each rider strip being zigzag in plan view so that the sides of the rider strips present alternating peaks and valleys, the bottoms of the valleys on one side being spaced from the bottoms of the valleys on the other side of a rider strip to provide unbroken stock of substantial width, and an elongated traction-augmenting member positioned in said unbroken stock in at least some of said rider strips, the peaks on the sides of the rider strips providing rubber stock projecting beyond the sides of the traction-augmenting members to retain the latter in position during use, which rubber stock is in the form of a series of triangular blocks, the width of the traction-augmenting members being substantially equal to the transverse distaance

between the bottoms of the valleys on one side of the rider strip and the bottoms of the valleys on the other side of the rider strip, there being a sipe slit extending transversely into each of said triangular blocks from the peak thereof, the length of each sipe slit being substantially equal to the altitude of each triangular block.

3,910,333
LINK CONNECTION FOR TIRE CHAINS

Anton Muller, Unterkochen, Germany, assignor to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Germany

Filed Sept. 3, 1974, Ser. No. 502,629
Claims priority, application Germany, Sept. 1, 1973, 2344232
Int. Cl.² B60C *27/00*
U.S. Cl. 152—243 **16 Claims**

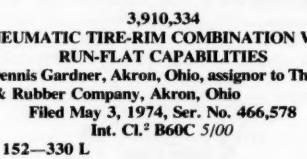


1. A link connection for tire chains which includes at least one web link having a link body with two oppositely located end edges and with two engaging openings extending through said link body, said openings being located in the longitudinal direction of said link body opposite to each other while being set back relative to said end edges of said link body, at least one annular connecting link having engaging sections located opposite each other with one of said engaging sections in engagement with a wall defining one of said two engaging openings, the ratio of the cross-sectional width measured in the direction of the straight connecting line between said two engaging sections to the inner distance of said engaging sections and to the distance between said engaging openings of said web link approximately equaling 1:4:4 with a maximum deviation of said two distances in the magnitude of ± 2/10 of the cross-sectional width of the respective adjacent engaging section.

3,910,334
PNEUMATIC TIRE-RIM COMBINATION WITH RUN-FLAT CAPABILITIES

James Dennis Gardner, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 3, 1974, Ser. No. 466,578
Int. Cl.² B60C *5/00*
U.S. Cl. 152—330 L **2 Claims**

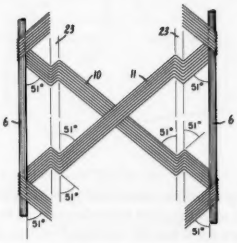


1. A pneumatic tire-rim combination wherein the inflation chamber defined by said tire and rim contains a plurality of free-floating capsules, said capsules having a thin-walled outer shell capable of withstanding the ambient conditions within the inflation chamber, said shell encloses a lubricant-sealant material so that said capsules will remain integral when the tire is operating under normal conditions but will break when the tire is run-flat thereby releasing said lubricant-sealant material to protect said tire from damage as a result of being run-flat.

3,910,335
TIRE HAVING CARCASS CORDS DESCRIBING S-SHAPED AND Z-SHAPED PATHS

Jacques Boileau, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Division of Ser. No. 189,657, Oct. 15, 1971, Pat. No. 3,782,441. This application Aug. 30, 1973, Ser. No. 392,867
Int. Cl.² B29H *9/04, 17/26, 17/28*
U.S. Cl. 152—356 **8 Claims**



1. In a ply of carcass cords to be used in manufacturing a tire which comprises a tread and a pair of sidewalls at opposite edges of the tread and extending radially inwardly therefrom, the improvement in which said carcass cords are inclined with respect to the longitudinal direction of the tire, the cords in a central portion adjacent to the location at which said tread is to be applied and in two side portions beyond the location at which said tread is to be applied and in locations intended to be included in said sidewalls, respectively, being permanently inclined in one direction and in two intermediate portions beyond the location at which said tread is to be applied and in locations intended to be included in said sidewalls, respectively, being permanently inclined in the other direction with respect to said longitudinal direction.

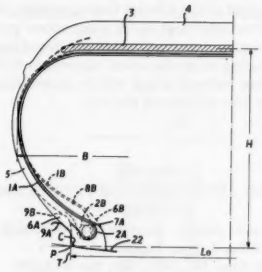
3,910,336
WIDE RADIAL TIRE AND RIM THEREFOR

Jacques Boileau, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Mar. 27, 1974, Ser. No. 455,506
Claims priority, application France, Apr. 9, 1973, 73.12758
Int. Cl.² B60C *9/02, 15/02*
U.S. Cl. 152—379 **12 Claims**

1. A tire and rim assembly wherein the tire comprises a tread portion, a tread reinforcement in the tread portion, a pair of sidewalls respectively on opposite sides of the tread portion, a pair of beads respectively at the inner edges of the sidewalls, a pair of bead rings respectively in the beads, and a carcass reinforcement that is radial at least from the midheight of the respective sidewalls to the respective beads and extends from one bead to the other, the tire having a height H and a breadth B, the ratio H/B being less than one, and the carcass reinforcement having a neutral fiber that follows, at least, between the midheight of the respective sidewalls and the locations where it meets the respective bead rings, the natural equilibrium curve of a single-ply radial carcass that is without a tread reinforcement and that is subjected to internal pressure, said curve being tangent to the bead rings and passing through the edges of the tread reinforcement and through equator points where the sidewalls have a maximum distance

B from each other and wherein the rim comprises a base, a bead seat on either side of the base, and an edge on the outer side of each seat, each edge comprising a portion substantially

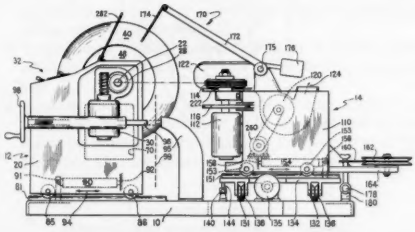


parallel to the adjacent segment of said neutral fiber, said portion being connected to the adjoining bead seat by an S-shaped curve and being terminated on the outside by a curvature towards the axis of rotation of the tire.

3,910,337
TIRE BUFFING APPARATUS AND METHOD

Guy Pelletier, Melbourne, Canada, assignor to Bombardier Limited, Valcourt, Canada

Filed Apr. 10, 1974, Ser. No. 459,645
Int. Cl.[2] B29H *21/08*
U.S. Cl. 157—13 **11 Claims**



1. For use in an apparatus for buffing tires having a rotatable shaft with a threaded free end, a split chuck comprising a first tire bead engaging disc mounted to said shaft inwardly of the free end thereof, a second tire bead engaging disc closely fitting over the free end of said shaft and slidable therealong inwardly of the threads on said shaft a main nut having at least two axial apertures extending therethrough and engageable over the threaded portion of said shaft, means on said main nut for aiding the rotation thereof, a spacer between said nut and said second disc, at least two registering pins projecting axially outwardly from said spacer and extending through the axial apertures in said main nut and at least two coil springs, each coil spring being disposed over one of said registering pins and extending between the outer face of said spacer and the inner surface of said main nut for urging said spacer and said second tire bead engaging disc toward said first tire bead engaging disc when said main nut is mounted on said shaft, air supply means extending longitudinally of said shaft and leading to a discharge point located between said tire bead engaging discs in such a manner as to enable inflation of a tire in position on said chuck.

2. A method for buffing a worn tire with a buffing apparatus wherein the profile of the buffed surface is determined by a template, comprising rotating said tire in a first sense, grinding the worn engaging surface of said tire to a pre-determined depth by means of a buffing rasp whose axis is normal to the axis of rotation of said worn tire until said worn tire has obtained the desired profile, and as a last step in the buffing operation, rotating said tire in the opposite sense while said buffing rasp executes a last pass without changing the profile nor the depth of the cut.

3. Apparatus for buffing tires in preparation for retreading, comprising a buffing assembly which includes a housing and a buffing wheel, a tire mounting assembly, and support means for said buffing assembly and said tire mounting assembly; said apparatus further comprising:

first horizontal rectilinear rail means parallel to the plane of the tire once in place on said tire mounting assembly, said first rail means supporting said tire mounting assembly and permitting displacement thereof along said first rail means,

second horizontal rectilinear rail means extending in a direction normal to said first rail means, said second rail means supporting said buffing assembly for displacement in a direction parallel to the axis of rotation of a tire mounted on said tire mounting assembly,

first drive means for moving said buffing assembly along said second rail means in a back-and-forth motion during the buffing operation,

an auxiliary carriage disposed between said buffing assembly and second rail means, said buffing assembly being displaceably mounted on said auxiliary carriage in a direction parallel to said first rail means, and said auxiliary carriage being horizontally displaceable in straight line in a direction normal to said first rail means,

a template adjustably fixed relatively to said buffing assembly and said auxiliary carriage and to said support means, cam follower disc means carried by said buffing assembly for following the contour of said template throughout said back-and-forth motion,

first moving means for moving said buffing assembly on said auxiliary carriage away from said tire between two buffing operations and for returning said buffing assembly in position for buffing and while in said position resiliently urging said cam follower disc means in contact with said template,

first power means for rotating said tire during buffing,

second power means for rotating the buffing wheel of said buffing assembly in one sense when said buffing assembly travels in one sense along said second rail means, and in the opposite sense when said buffing assembly moves in the opposite sense,

limit switch means for controlling the sense of rotation of said buffing wheel while said first drive means is in operation and for controlling the sense of travel of said buffing assembly,

second moving means for moving said tire mounting assembly away from said buffing assembly during the installation and removal of said tire, and for returning said tire mounting assembly in position for buffing, and while in said position resiliently urging said tire mounting assembly toward said buffing assembly with a force greater than the force applied by said first moving means for maintaining said cam follower disc means in contact with said template,

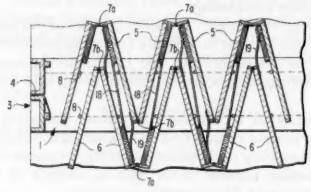
fine adjustment means for determining the position of said tire mounting assembly in relation to the position of said template during buffing said tire,

dust collector means for aspirating the rubber dust produced by the buffing wheel during the buffing of said tire, wherein said fine adjustment means comprises the combination of an abutment, fixed with respect to said support means, a horizontally disposed plunger extending in the direction of said first rail means toward said abutment and mounted to said tire mounting assembly, said plunger being maintained in contact with said adjustment by means of said second moving means when said tire mounting assembly is in position for buffing, and a control wheel whose angular position determines the position of said plunger relative to said tire mounting assembly.

3,910,338
DOUBLE FOLDING PARTITION

Eskild Pontoppidan, No. 92 Langs Hegnet, 2800 Lyngby, Denmark

Filed Dec. 27, 1973, Ser. No. 428,942
Claims priority, application Denmark, Jan. 9, 1973, 102/73
Int. Cl.[2] E06B 3/48, 3/46
U.S. Cl. 160—199 5 Claims

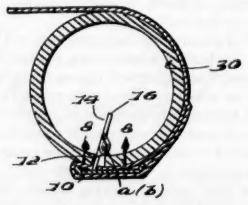


1. A double folding panel structure comprising two sets of rectangular panels that are all of the same width, hinge means connecting the adjoining vertical edges of the panels of each set of panels in such a way that both sets of panels are movable between an extended position in which the panels of each set of panels are substantially co-planar and are in generally opposed, parallel laterally spaced relation to the panels of the other set of panels, and a retracted position in which the panels of each set are each rotated substantially 90° about vertical axes and are sandwiched between the panels of the other set, and suspension means for each of said sets of panels, said suspension means including a pair of guiding rails mounted in parallel relation and laterally spaced from one another a distance less than said width of the respective panels, a plurality of runners mounted on and movable along each of said rails, said runners each being connected to a panel of one of said sets of panels so as to permit the movement thereof between said extended and retracted positions, each intermediate panel of each set of panels being connected to one adjoining panel by a hinge of a first type, the axis of which is spaced at least a distance corresponding to the thickness of a panel inwardly from the inner surface of the panel, and to the other adjoining panel by a hinge of a second type, the axis of which is spaced outwardly from said inner surface at least a distance corresponding to the thickness of the panels, each hinge of said first type incorporated in one of said sets of panels being opposite to a hinge of said second type incorporated in the other set of panels.

3,910,339
WEBBING STRIP-TO-TUBULAR FRAME MEMBER FASTENINGS

Hyman Kramer, Stamford, Conn.

Continuation-in-part of Ser. No. 207,314, Dec. 13, 1971, abandoned. This application Feb. 20, 1974, Ser. No. 444,012
Int. Cl.[2] A47C 7/14, 31/02
U.S. Cl. 160—404 5 Claims

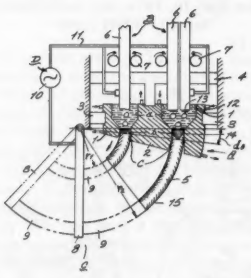


1. In a webbing strip-to-tubular member fastening, a tubular frame member, a webbing strip having an end portion extending as a partial wrap about said frame member, and a clip securing said webbing-strip end portion to the frame member, said clip comprising an elongated bar-form head part and a prong integral with said head part extending at a substantial right angle therefrom, said prong piercing the webbing strip and projecting through an elongated slot provided for its reception in the wall of the tubular frame member, said prong having overall thickness and width dimensions greater than the width and length dimensions, respectively, of the slot, and said prong including in its thickness dimension locking-barb formations having inclined edges which extend beneath and lock to opposite end corners of the slot.

3,910,340
PROCESS AND APPARATUS FOR PRODUCING BENT TUBES

Akira Ujiie, Kobe, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1974, Ser. No. 473,270
Claims priority, application Japan, May 25, 1973, 48-57716
Int. Cl.[2] B22D 27/02
U.S. Cl. 164—52 3 Claims

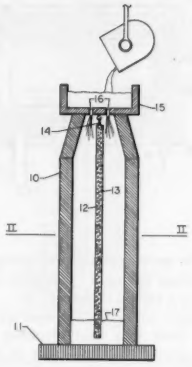


1. A process for producing an elbow which comprises melting a plurality of consumable metallic electrode materials supplied at a predetermined speed into a mold consisting of an outer mold and a core mold in an electroslag bath, coagulating the obtained molten metal inside said mold and pulling out the coagulated metal at a predetermined speed from said mold to produce an elbow having a predetermined degree of curve, making the amount of the slag bath on the side of an outer radius of curve of the elbow inside an upwardly opening portion between said outer mold and said core mold larger than that on the side of an inner radius of curve of the elbow, at the same time making the amount of the consumable metallic electrode materials supplied into the slag bath on the side of the outer radius of curve of the elbow (p) larger than the amount of the consumable metallic electrode materials supplied into the slag bath on the side of the inner radius of curve of the elbow so as to make said amount (p) correspond to the cross-sectional configuration of the elbow to be produced and the unit volume of the elbow per unit angle around the center of curve of the elbow, characterized by increasing the plane area inside said upwardly opening portion holding the slag bath between said outer mold and said core mold as said portion transfers from the side of the inner radius of curve of the elbow to the side of the outer radius of curve of the elbow.

3,910,341
METHODS OF ADDING REACTIVE METALS TO FORM A REMELTING ELECTRODE

Robert B. Herchenroeder, and Howard Joseph Klein, both of Kokomo, Ind., assignors to Cabot Corporation, Kokomo, Ind.

Filed June 24, 1974, Ser. No. 482,062
Int. Cl.[2] B22D *27/20*
U.S. Cl. 164—59 **9 Claims**



1. The method of forming a remelting electrode containing reactive metals to be subsequently remelted in one of the known remelt techniques comprising the steps of:

a. forming said reactive metal to be added into an elongated member having a length substantially equal to the length of the remelting electrode;

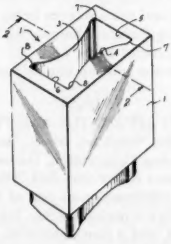
b. suspending said formed reactive metal in a mold having a height equal to the length of the remelting electrode; and

c. pouring the molten metal to be treated around said formed reactive metal in said mold, whereby said reactive metal becomes an integral part of the formed remelting electrode for subsequent remelting.

3,910,342
MOLDS FOR CONTINUOUS CASTING

Lyle J. Johnson, Southgate, Mich., assignor to Irving Rossi, New York, N.Y.

Filed Nov. 12, 1973, Ser. No. 414,949
Int. Cl.[2] B22D *11/02*
U.S. Cl. 164—273 R **5 Claims**

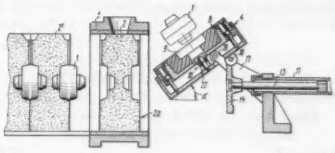


1. A continuous casting mold for casting steel strands of substantially rectangular cross section, said mold having a substantially rectangular mold passage extending therethrough, a major portion of the surfaces of at least two of the opposed walls of said mold passage being convex in transverse cross section, the radius of curvature of said convex surfaces being progressively greater at successively lower cross sections through the mold wall.

3,910,343
DEVICE FOR PLACING CORES INTO REMOVABLE-FLASK MOULDS

Alexei Ivanovich Popov, 531 mikroraion, 1a, kv. 51; Jury Georgievich Vinjukov, ulitsa Mayakovskogo, 11, kv. 15; Leonid Iosifovich Matjurin-Veretennikov, ulitsa Poltavskaya, 3, kv.10; Vladimir Ovseevich Kashket, ulitsa 23 Avgusta, 31a kv. 76, and Vladimir Mikhailovich Stepanov, Pavlova-pole, 5 mikroraion, 75, kv. 14, all of Kharkov, U.S.S.R.

Filed Aug. 16, 1974, Ser. No. 498,222
Int. Cl.[2] B22C *19/00, 23/00*
U.S. Cl. 164—340 **3 Claims**

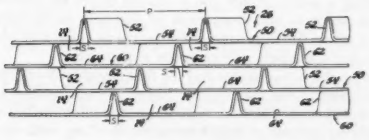


1. A device for placing cores into removable-flask moulds, comprising: a body having a port; guides mounted in said body, a jig arranged on said guides with a possibility of travelling in relation to said body in a direction perpendicular to the jointing plane of a removable-flask mould located in the moulding chamber of a machine adapted for making removable-flask moulds; said jig having open core seats; a stationary member; a drive mounted on said stationary member and associated through its movable member with said body so as to reciprocate said body with the jig in said direction; spring-biased pushers mounted in said body, freely entering into the seats of said jig from the side opposite to the location of the cores and acting upon the latter in the course of relative travel of said jig and body, said pushers in the course of subsequent joint travel of said jig and body also acting upon said mould so as to push it out of said moulding chamber; a stop secured on said stationary member from the side opposite to the location of the jig, said stop in the course of the joint travel of said body and jig to the initial position entering into the port of said body and urging said jig therefrom to a distance sufficient for said pushers to emerge from the seats thereof.

3,910,344
REGENERATOR MATRIX

Robert J. Hagen, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1974, Ser. No. 455,047
Int. Cl. F28d *19/00*
U.S. Cl. 165—10 **3 Claims**



1. A rotary regenerator matrix structure of annular form porous to flow of fluid generally parallel to the axis of the matrix and effective to block fluid flow circumferentially around the axis, the matrix structure comprising first and second spiral wound strips with each turn of the first strip disposed between adjacent turns of the second strip and with the strips abutting face to face and fixed together into a rigid,

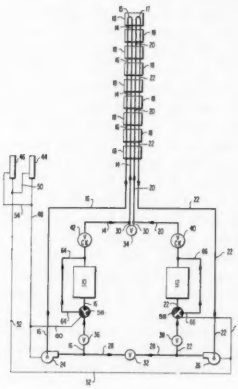
elastic structure, the first strip being provided with spaced apart corrugations inclined at a relatively small angle of approximately ½° to 4° in one direction relative to the axis of the matrix, the portion of said first strip between said spaced apart corrugations thereon being substantially flat sheet stock material, the second strip being formed with spaced apart corrugations inclined in the opposite direction and at an equivalent angle to the axis of the matrix from the corrugations of the first strip, the portion of said second strip between said spaced apart corrugations thereon being substantially flat sheet stock material, the corrugations of the first strip and of the second strip having substantial depth radially of the matrix to separate radially the turns of the other strip, the corrugations extending from one side only of each said strip, the opposite side of each said strip presenting substantially a flat surface against which the peaks of said corrugations of the adjacent strip abut to define substantially rectangular fluid flow passages between adjacent strips, the circumferential extent of said passages being defined by said corrugations.

3,910,345

HEATING AND COOLING SYSTEM

James J. Whalen, Clarkson Drive, Fulton, Md. 20759

Filed Apr. 22, 1974, Ser. No. 463,047
Int. Cl.[2] F24F *3/00;* **F25B** *29/00*
U.S. Cl. 165—22 **11 Claims**



1. In a heating and cooling system having a plurality of zones to be heated and cooled, a hot water heat exchange unit and a cold water heat exchange unit in each of the zones, a hot water piping circuit including a water heater and a first pump for circulating hot water to and from each of the hot water heat exchange units and a separate chilled water piping circuit including a water chiller and a second pump for circulating chilled water to and from each of the cold water heat exchange units; the improvement comprising valve and conduit means for selectively and mutually exclusively:

placing the water heater and the first pump in fluid communication with the chilled water circuit, whereby the chilled water circuit may be utilized to circulate hot water during periods of high heat demands along with said hot water circuit thereby allowing smaller water pipes to be used in the hot water circuit; and

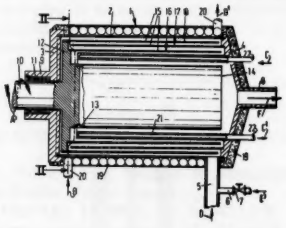
placing the water chiller and the second pump in fluid communication with the hot water circuit, whereby the hot water circuit may be utilized to circulate chilled water during periods of high cooling demand along with said cold water circuit thereby allowing smaller water pipes to be used in the chilled water circuit.

3,910,346

MIXER

Johannes Gerardus ter Braak, Schiedam, Netherlands, assignor to Gebrs. Ter Braak B.V., Rotterdam, Netherlands

Filed Jan. 23, 1974, Ser. No. 435,860
Int. Cl.[2] F28F *13/12*
U.S. Cl. 165—109 **7 Claims**



1. Apparatus for treating fluids comprising, in combination: a cylindrical housing having a cylindrical wall and opposite end walls defining a closed chamber;

fluid inlet means connected to said cylindrical wall for introducing fluid into said chamber and fluid outlet means connected centrally to one of said end walls for discharging fluid from said chamber;

drive means projecting centrally through that other end wall opposite said one end wall and including a rotatable disc closed spaced adjacent said other end wall and an agitating shaft fixed centrally to said disc and projecting axially to a point closely spaced from said one end wall, said agitating shaft being of greater diameter than said outlet means so as to constrain fluid to flow around the free end of said agitating shaft in passing to said outlet means;

a hollow heat exchange sleeve-like body fixed to said one end wall and disposed coaxially of said agitating shaft to define an annular space therewith, said body terminating adjacent to but spaced from said disc;

a first sleeve fixed to said disc coaxially of said body in surrounding, spaced relation thereto to define a second annular space therewith, said first sleeve terminating adjacent to but spaced from said one end wall;

a second sleeve coaxial with and surrounding said first sleeve to define a third annular space therewith, said second sleeve being fixed to said one end wall and terminating adjacent to but spaced from said disc;

a third sleeve fixed to said disc and disposed coaxially of and in surrounding relation to said second sleeve to define a fourth annular space therewith, said third sleeve terminating adjacent to but spaced from said one end wall;

said first, second and third sleeves being perforate;

means for flowing heat exchange medium through said hollow heat exchange body; and

heat exchange means surrounding said cylindrical wall.

3,910,347

COOLING APPARATUS AND PROCESS

Herman N. Woebcke, Wayland, Mass., assignor to Stone & Webster Engineering Corporation, Boston, Mass.

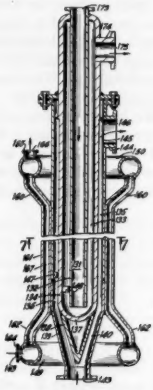
Continuation-in-part of Ser. No. 802,790, Feb. 27, 1969, abandoned, and a continuation-in-part of Ser. No. 877,575, Nov. 26, 1969, which is a division of Ser. No. 802,790, Feb. 27, 1969, abandoned, and a continuation-in-part of Ser. No. 729,878, May 10, 1968, abandoned, which is a division of Ser. No. 557,005, June 13, 1966, Pat. No. 3,403,722. This application Sept. 16, 1970, Ser. No. 72,765
Int. Cl. F28d *7/12;* **F28f** *13/08*
U.S. Cl. 165—142 **18 Claims**

1. A heat exchange apparatus comprising:

a divergently shaped inlet section for the flow of hot fluid

therethrough configured with a total divergence angle between 4° and 7°;

a downstream section for the flow of hot gases passing from the inlet section which downstream section extends from the downstream end of the inlet section and has a constant cross-sectional area equal to the cross-sectional area



of the downstream end of the divergently shaped inlet section;

means for cooling the hot fluid flowing through the heat exchanger apparatus;

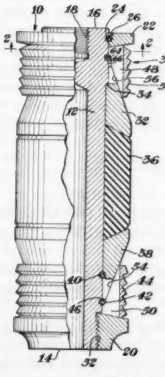
whereby the flow of the hot gases is substantially turbulence-free during the passage thereof through the heat exchange apparatus.

3,910,348

DRILLABLE BRIDGE PLUG

Charles A. Pitts, Wichita Falls, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 26, 1974, Ser. No. 492,119
Int. Cl.² E21B *23/06, 33/129*
U.S. Cl. 166—134 **3 Claims**



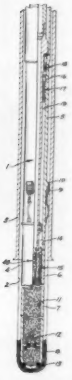
1. A bridge plug for use in well bores and the like comprising an elongated mandrel having an upper end including setting tool attachment means, and a lower end having threads on its outer peripheral part, a base element, said base element being threadedly engaged with said threads on said mandrel, and a lower slip member, lower cone member, packing element, upper cone member, upper slip member and top plate being disposed around said mandrel in the named order, said packing element having ends each of which abut against one of said cone members, each cone member having a tapered surface which tapers towards said mandrel from that part of its outer surface which is adjacent to said packing element, each of said slip members having a tapered under surface adapted to bear against the tapered surface of its adjacent cone member, said lower slip member abutting against said base element and said upper slip member abutting against said top plate, an array of **0** rings, each of said **0** rings lying in a groove in the outer periphery of said mandrel and abutting against an upper or lower inner edge of a retained part of said plug, said grooves being so disposed along said mandrel that, until the **0** rings contacting said upper slip member and said lower cone member are sheared, downward movement of said upper slip member, upper cone member, packing element and lower cone member is prevented.

3,910,349

APPARATUS AND METHOD FOR CEMENTING WELL LINERS

Joe R. Brown; Chudleigh B. Cochran, and James W. Montgomery, all of Houston, Tex., assignors to Brown Oil Tools, Inc., Houston, Tex.

Filed Nov. 6, 1974, Ser. No. 521,346
Int. Cl.² E21B *33/14, 43/10*
U.S. Cl. 166—153 **19 Claims**



1. Apparatus for cementing a liner in a well bore comprising:

a. a setting tool having a tubular mandrel connected in a pipe string for extension through said liner;

b. seal means releasably attached to said liner and sealingly engaging the exterior of said mandrel and the interior of said liner permitting at least limited axial movement of said mandrel without movement of said seal means;

c. latch means included with said seal means engageable with corresponding groove means within said liner to releasably hold said seal means against axial displacement therein; and

d. said mandrel comprising a first portion and an axially spaced second portion of less diameter than said first portion, said first portion when in registration with said latch means preventing disengagement of said latch means from said groove means, said second portion when in registration with said latch means allowing disengagement of said latch means from said groove means.

3,910,350

HYDROCARBON RECOVERY IN WATERFLOODING

Martin J. Mastroianni, Buffalo, N.Y., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 16, 1974, Ser. No. 470,585
Int. Cl.² E21B *43/22*
U.S. Cl. 166—274 **8 Claims**

1. A process for recovering hydrocarbons from hydrocarbon-containing formations, comprising the steps

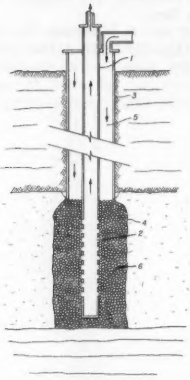
a. injecting a solution of asphalt in a solvent into at least one injection well of a water-wet formation so as to change the formation from its water-wet to an oil-wet state; thereafter
b. introducing an aqueous fluid into said formation so as to force at least a portion of the hydrocarbons into at least one production well; and
c. recovering said hydrocarbons from said production well.

3,910,351

SAND CONTROL METHOD EMPLOYING ASPHALTENES

Ching H. Wu; Alfred Brown, and Daniel T. Konopnicki, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed July 25, 1974, Ser. No. 491,985
Int. Cl.[2] E21B *43/04*
U.S. Cl. 166—276 **12 Claims**



1. A method of treating a subterranean unconsolidated sand and petroleum containing formation penetrated by at least one well, said well being in fluid communication with the subterranean formation, for the purpose of forming a permeable barrier around the well to restrain the movement of sand particles while permitting the passage of petroleum therethrough, comprising:
a. introducing a pre-determined quantity of granular material into the well bore adjacent the formation;
b. introducing bituminous petroleum into the granular material;
c. introducing an asphalt precipitating solvent selected from the group consisting of paraffinic hydrocarbons having from 3 to 10 carbon atoms, furfural, N-methyl-2-pyrrolidone, and mixtures thereof; and
d. introducing a heated fluid into the granular material at a temperature of at least 250°F to solidify the precipitated asphalt.

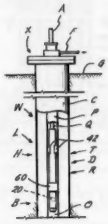
3,910,352

IN-TUBING SAFETY VALVE WELL TOOL

James D. Mott, Houston, Tex., assignor to Hydril Company

Continuation of Ser. No. 291,561, Sept. 25, 1974, abandoned. This application Sept. 9, 1974, Ser. No. 504,301
Int. Cl.[2] E21B *43/00, 43/12*
U.S. Cl. 166—315 **9 Claims**

1. A well tool for controlling flow of well fluids through the bore of a first production tubing at a desired subsurface location in a well, including:
a first production tubing extending downwardly from the earth surface in a well;
a tubular housing movable through the bore of the first production tubing to and from the desired subsurface location and having a flow passage extending therethrough for enabling communication of well fluids and the like in the bore of the first well tubing past said tubular housing;
bore closure means mounted with said housing and movable to and from an open position for enabling flow of fluid through said flow passage and a closed position for substantially blocking flow of fluid through said flow passage;
a second production tubing sealingly connected with said tubular housing and having a bore disposed in flow communication with said flow passage and extending upwardly from said tubular housing within the bore of the first production tubing for forming a flow passage for well fluids from said tubular housing to the earth surface separate from the bore of the first production tubing, said second production tubing spaced from said first production tubing;



means for releasably securing said tubular housing with the first well tubing at a desired subsurface location, said means for releasably securing actuated by increasing fluid pressure in the bore of the second production tubing and said flow passage;
means for releasably sealing said tubular housing with the first production tubing to direct the flow of well fluids from the bore of the first production tubing below said tubular housing into said flow passage, said means for sealing actuated by said means for releasably securing to effect sealing when said tubular housing is secured with the first production tubing; and
actuator means mounted with said housing for effecting movement of said bore closure means to and from the open and closed positions in response to a control fluid pressure communicated to said actuator means from the bore of the first production tubing through a port in said housing located above said means for sealing and separately from the well fluids in the bore of the second production tubing wherein said well tool is operably installed in a well.

3,910,353

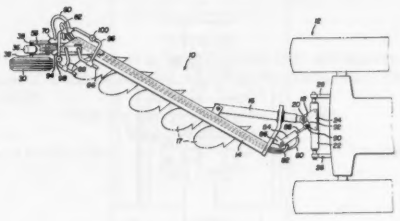
HYDRAULIC FLOW STEERING

Harold A. Ralston, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed May 3, 1974, Ser. No. 466,592
Int. Cl.[2] A01B *79/00, 69/08;* **B62D** *13/00;* **F15B** *7/10*
U.S. Cl. 172—1 **6 Claims**

1. In an earth working implement having a steering system including a master cylinder and piston interconnected between the front of the implement and the rear of a prime mover, and a slave cylinder and piston pivotally connected between the rear of the implement and a steering wheel, with said cylinders being interconnected by a pair of separate conduits to define a closed hydraulic circuit, said slave cylinder steering the earth working implement in response to hydraulic fluid circulated through said pair of conduits by said master cylinder in response to steering of the prime mover, said earth working implement further including means for lifting the implement relative to the steering wheel, wherein said lifting means includes a second hydraulic circuit through

which hydraulic fluid flows under pressure, the improvement of means for purging entrapped air from said master and slave cylinders and from each of said separate conduits comprising a purging conduit connecting each conduit of the steering



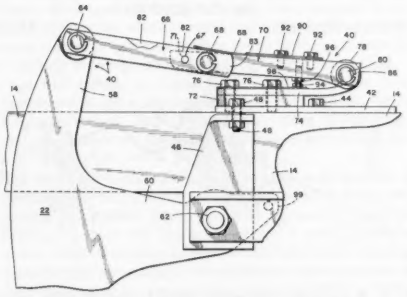
system to said second hydraulic circuit, and normally closed valve means in each of said purging conduits isolating said second hydraulic circuit from said closed hydraulic circuit, said valve means being openable for flowing hydraulic fluid between the two hydraulic circuits.

3,910,354

TOGGLE TRIP FOR MOLDBOARD PLOW

Otto E. Johnson, Hinsdale, and Gerald G. Ward, Naperville, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed July 26, 1974, Ser. No. 491,977
Int. Cl.[2] A01B *61/04, 15/02*
U.S. Cl. 172—267 **22 Claims**



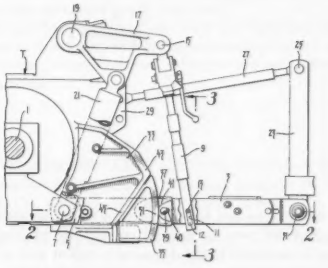
1. The combination with an earthworking implement having a frame and an earthworking tool pivoted to the frame for swinging movement about a transverse axis between a forward lower earthworking position and a rearward and upwardly inoperative position, the improvement which comprises an over-center toggle mechanism for maintaining the tool in its earthworking position under the influence of normal rearward reaction pressure against the tool during forward movement of the implement and for releasing the tool for rearward and upwardly swinging movement when said reaction pressure exceeds a predetermined maximum, said mechanism comprising a toggle arrangement including a pair of rigid toggle elements pivotally connected together at their inner ends to provide a center pivot, a first pivot pin connecting the outer end of one of said toggle elements to said tool, a second resiliently mounted shiftable pivot pin connecting the outer end of the other toggle element to the frame, cooperating engageable abutments normally effective between a medial region of the other toggle element and the frame about which said shiftable pivot pin rocks, means yeildingly biasing said resiliently mounted shiftable pivot pin to a position wherein said abutments are engaged when said toggle elements are in a slightly over-center position such that said center pivot is offset to one side of the line connecting said first pivot pin and said resiliently mounted shiftable pivot pin, said toggle elements, when in said over-center position, being responsive to endwise compressional force exerted thereagainst by said first pivot pin under normal tool reaction pressure to shift the toggle arrangement bodily as a unit endwise, thus rocking and shifting the resiliently mounted pivot pin so that said line approaches a dead-center position at which said line crosses the center pivot, said resilient means having a spring constant such that said line does not cross said center pivot so long as said reaction pressure does not exceed the predetermined maximum, and being responsive when said reaction pressure exceeds the predetermined maximum to shift said resiliently mounted pivot sufficiently to move said line past said dead-center position to the other side of said center pivot pin to thereby trip the toggle arrangement and release said tool for rearward and upwardly swinging movement.

3,910,355

SWAY CONTROL DEVICE

Lee E. Elfes, Bloomfield Hills; Otto Mueller, Jr., Detroit, both of Mich., and Jean J. Lasoen, Villepreux, France, assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Aug. 30, 1973, Ser. No. 392,912
Int. Cl. A01b *59/043*
U.S. Cl. 172—450 **6 Claims**

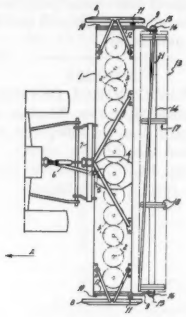


1. A tractor hitch including a pair of laterally spaced draft links pivotally mounted on a tractor frame for up and down vertical movement about a transverse axis between a lower operative position and an upper transport position, and for lateral sway in a plane passing through said axis, a first pair of laterally spaced sway blocks mounted on said frame, a second pair of laterally spaced sway blocks removably mounted on said frame, means for removably attaching said second pair of sway blocks to said frame, said first pair of sway blocks having first upper outwardly facing vertical surfaces spaced apart a first distance and located on a first predetermined radius from the transverse axis and having second lower outwardly facing vertical surfaces at said operative position spaced apart a second distance substantially less than said first distance and located a distance from said transverse axis less than said predetermined radius, said second pair of sway blocks having outwardly facing vertical surfaces spaced apart when mounted on said frame a distance equal to said first distance and located a distance from said transverse axis equal to said predetermined radius and being at said operative position, rub means on said links located a distance from said transverse axis equal to said transverse axis equal to said predetermined radius, whereby the rub means on said links are not opposite said second lower outwardly facing, surfaces in the lower operative position of said links but are opposite the said first upper surfaces in the upper transport position of said links, and whereby the rub means on said links in the operative position are opposite the vertical surfaces on said second pair of sway blocks when said second pair of sway blocks are attached to said frame and said links are in said lower operative position. **8**

3,910,356
ROTATABLE SOIL ENGAGING ATTACHMENTS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 374,796, June 28, 1973, abandoned.
This application Nov. 18, 1974, Ser. No. 524,883
Claims priority, application Netherlands, June 29, 1972, 7208990
Int. Cl.² A01B *21/00*
U.S. Cl. 172—552 8 Claims



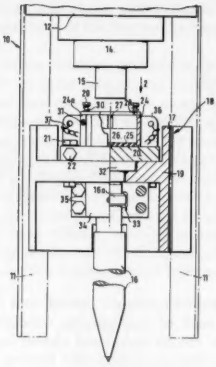
1. An attachment for connection to an agricultural implement movable over the ground, comprising an elongated roller having a centrally located axis of rotation and a plurality of longitudinal elements positioned around the circumference of said roller, support means on said roller around said axis of rotation and said support means comprising a plurality of pairs of circular plates, said plates of each pair being secured to one another and defining supports spaced along said axis, said plates having anchorages about their peripheries for securing some of said elongated elements in fixed positions, apertured lugs on said peripheries that receive and retain other said elongated elements, said anchorages each being located between two of said lugs, said apertured lugs loosely holding said other elements and the latter being turnable in their respective apertured lugs and detachable from said attachment.

3,910,357
CUSHIONED ANVIL FOR ROCK HAMMERS AND THE LIKE

Lawrence Nancarrow, Tynemouth, England, assignor to Arrow Construction Equipment Ltd., England

Filed Apr. 15, 1974, Ser. No. 461,148
Claims priority, application United Kingdom, Apr. 19, 1973, 19037/73
Int. Cl.² E21C *37/24*
U.S. Cl. 173—131 3 Claims

1. A rock breaking hammer or drill comprising a frame having a tool holder mounted thereon and a blow-imparting member reciprocable on the frame towards and away from the tool holder, said tool holder having a stepped chamber, an anvil in said chamber, a thick metal plate rigidly secured to the tool holder and closing the chamber, said plate being held in contact with the anvil, a rubber pad supported directly on the thick metal plate and a striker plate supported directly on the rubber pad to be struck by the blow-imparting member, and a rock breaking tool supported by the tool holder with limited

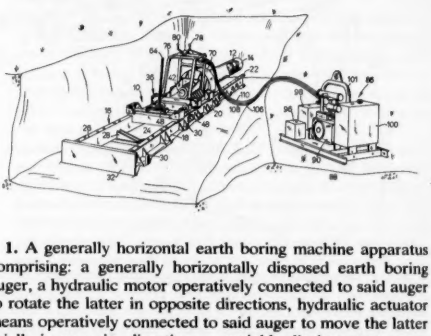


freedom lengthwise of the tool to be held in contact with the anvil when the tool rests on the rock which is to be broken.

3,910,358
HORIZONTAL EARTH BORING MACHINE

Norman A. Martinek, Milwaukee, Wis., assignor to Koehring Company, Milwaukee, Wis.

Filed July 5, 1974, Ser. No. 485,803
Int. Cl.² E21D *9/10*
U.S. Cl. 173—152 15 Claims



1. A generally horizontal earth boring machine apparatus comprising: a generally horizontally disposed earth boring auger, a hydraulic motor operatively connected to said auger to rotate the latter in opposite directions, hydraulic actuator means operatively connected to said auger to move the latter axially in opposite directions, a variable displacement pump located in a selected position independently of the position of said motor and actuator means and having a discharge for delivering hydraulic fluid to said motor and actuator means, first directional control valve means controlling communication between said pump discharge and said motor, second directional control valve means controlling communication between said pump discharge and said actuator means, hydraulic means responsive to hydraulic pressure to vary the displacement of said pump, control means for delivering hydraulic fluid to said hydraulic means, said control means having a pair of signal ports, one of said signal ports being in communication with said pump discharge, first regulating means between said motor and the other of said signal ports and being responsive to pressure in said motor greater than in said actuator to communicate pressure to said other of said signal ports, second regulating means operatively disposed between said actuator means and said other of said signal ports and being responsive to pressure in said actuator means greater than in said motor to communicate pressure to said

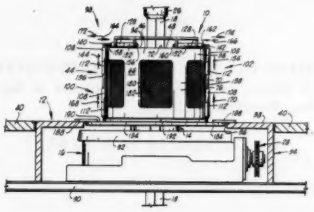
other of said signal ports, said hydraulic means being operative to vary the displacement of said pump to maintain a predetermined pressure differential between said pair of signal ports up to a predetermined pressure level at said pump discharge.

3,910,359

SAFETY GUARD FOR WELL DRILLING APPARATUS

Albert J. Childress, 701 N. Anita Dr., Oklahoma City, Okla. 73127

Filed Jan. 26, 1973, Ser. No. 326,666
Int. Cl. E21b *41/00*
U.S. Cl. 173—165 **14 Claims**



1. A safety guard for use on a well drilling rig platform protectively guarding portions of a rotary table, portions of a well drilling rig Kelly and portions of a rotary drive bushing, the rotary drive bushing being connected to a portion of the Kelly and engageable with a portion of the rotary table and the rotary table imparting rotary motion to the Kelly via the rotary drive bushing in one position, the safety guard comprising:

a cage wall having an upper end, a lower end, an inner peripheral surface forming a cage opening extending through the cage wall intersecting portions of the upper and the lower ends thereof, and an outer peripheral surface; and

means having a portion engaging the lower end portion of the cage wall and a portion engaging a portion of the well drilling rig platform supporting the cage wall on the well drilling rig platform generally above a portion of the rotary table, a portion of said means having an opening therethrough providing communication with a portion of the rotary table in one position, the cage opening being in communication with the rotary table via the opening in said means and a portion of the kelly extending through the cage opening and through the opening in said means, a portion of the Kelly and the rotary drive bushing connected thereto extending through the cage opening, said means removably supporting the cage wall ina stationary position with the inner peripheral surface of the cage wall surrounding a portion of the rotary drive bushing during the rotation of the Kelly via the rotary motion imparted to the rotary drive bushing via the rotary table.

3,910,360

METHOD AND APPARATUS FOR COLLECTING AND SEPARATING DUST DURING AIR-FLUSHED ROCK DRILLING USING A VIBRATING FILTER

Nils Goran Sundstrom, Alta, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

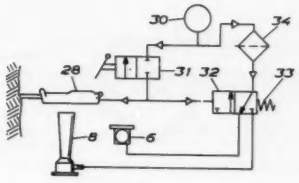
Filed July 11, 1973, Ser. No. 378,223
Claims priority, application Sweden, July 19, 1972, 9465/72
Int. Cl.² C09K *7/00;* **E21C** *7/00*
U.S. Cl. 175—38 **13 Claims**

1. Method for collecting and separating dust at air-flushed rock drilling by means of a dust collecting device having a vibrator-cleaned filter unit, comprising the steps of:

selectively supplying flush air to the rock drill;

circulating dust carrying air through the filter unit as the flush air is supplied to the rock drill;

sensing the pressure within the flush air supply conduit and determining when the sensed pressure falls below a predetermined value;



discontinuing the air circulation through the filter unit as the flush air supply to the rock drill is shut off responsive to said pressure within the flush air supply conduit falling below said predetermined value; and

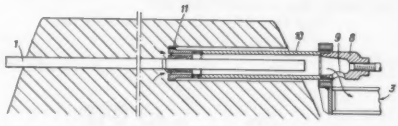
vibrating the filter unit only when the air circulation therethrough is discontinued responsive to said pressure within the flush air supply conduit falling below said predetermined value.

3,910,361

APPARATUS FOR DRILLING AND ENLARGING A BORE

Florian Hasewend, Kapfenberg, Austria, assignor to Gebr. Bohler & Co. Aktiengesellschaft, Vienna, Austria

Filed Nov. 14, 1973, Ser. No. 415,829
Claims priority, application Austria, Nov. 15, 1972, 9683/72
Int. Cl.² E21C *23/00*
U.S. Cl. 175—207 **1 Claim**



1. An earth boring apparatus for drilling a substantially horizontal borehole in a dam or the like, comprising in combination, a first pipestring, a first bore-head removably connected to the leading end of said first pipestring, a second pipestring having an interior diameter which is larger than the interior diameter of said first pipestring, a second borehead removably mounted on the leading end of said second pipestring, said first and second borehead being formed as percussion borecrowns, a percussion driving machine, first and second ejection bell members adapted to operatively connect the percussion driving machine respectively to said first and second pipestrings, said second pipestring having an interior diameter which is larger than the exterior diameter of said first pipestring; said second borehead has a substantially first cylindrical collar bit portion and a second inner substantially cylindrical collar bit portion, at least two substantially radially extending flange members connecting said first and second collar bit portions, said first and second collar bit portions having cutting members made of hard metal and said flange portion having cutting rods made of hard metal.

3,910,362
TIMER

Albert Piguet, Le Solliat, Switzerland, assignor to Aqustar S.A., Geneva, Switzerland

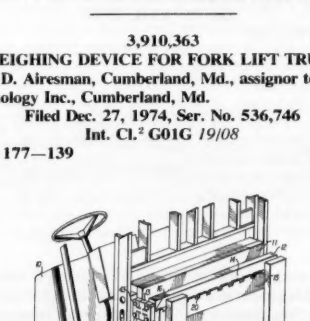
Filed Jan. 3, 1974, Ser. No. 430,419
Claims priority, application Switzerland, Jan. 4, 1973, 57/73
Int. Cl. G04f *7/04*
U.S. Cl. 58—74 **6 Claims**

1. A timer including a geared movement, a resilient driving device and a minutes indicator arranged to permit counting of a limited number of minutes, the timer comprising, a control mechanism to control movement of the minutes indicator along a stroke between two extreme start and stop positions, said control mechanism being alternately operable manually in one direction or by said driving device in a direction opposite to that effected by manual operation thereof, a connecting device positioned between the movement gearing and the minutes indicator, the connecting device including means to interrupt connection between the movement gearing and the minutes indicator at the end of the stroke of the minutes indicator, whereby upon manual operation of the control mechanism the minutes indicator is moved to its start position at which the minutes indicator is disconnected from the movement gearing and upon release of the control mechanism the driving device moves the minutes indicator to thereby connect the minutes indicator with the movement gearing.

3,910,363
WEIGHING DEVICE FOR FORK LIFT TRUCK

Charles D. Airesman, Cumberland, Md., assignor to Allegany Technology Inc., Cumberland, Md.

Filed Dec. 27, 1974, Ser. No. 536,746
Int. Cl.² G01G *19/08*
U.S. Cl. 177—139 **15 Claims**

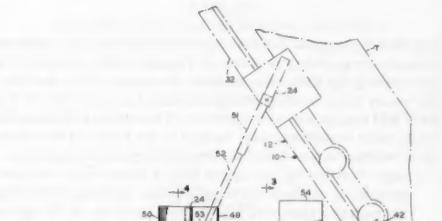


1. A weighing device for use with a fork lift truck and the like having forks to lift loads comprising:
a stationary plate mounted to the fork lift truck,
a moveable plate,
first flexure means mounted to the moveable and stationary plates to maintain the plates in substantially vertical parallel relationship, the forks being mounted to the moveable plate, the weight of loads introduced on the forks causing the moveable plate to be pulled vertically downwardly,
load cell means interposed between the stationary and moveable plates,
second and third flexure means coupled to opposite ends of the load cell means,
first and second mounting means connecting the second and third flexure means to the stationary and moveable plates respectively, the second and third flexure means responding in equal and opposite direction to bending moments resulting from the cantilever effect caused by the location of loads on the forks from toe to heel to prevent the load cell means from being responsive to said cantilever effect, the load cell means being responsive to vertical tension forces transmitted thereto by loads under measurement on the forks to derive an accurate indication of the weight thereof.

3,910,364
TRAILER DUMPING AND WEIGHING SYSTEM

Charles J. Baker, Portland, Oreg., assignor to Royal Industries, Inc., Pasadena, Calif.

Filed Jan. 20, 1975, Ser. No. 542,282
Int. Cl.² G01G *19/00;* **B65G** *67/24*
U.S. Cl. 177—145 **19 Claims**

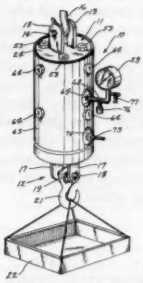


1. In combination:
a supporting base adapted to support the weight of a loaded vehicle;
a lift positioned above said base, adapted to support a loaded vehicle and to tilt the loaded vehicle from a generally horizontal position to a tilted position;
a first lift supporting member positioned on said base below said lift, adapted to support either tensional loads or compressional loads thereon, and including load sensing means adapted for sensing either tensional loads or compressional loads thereon;
a hinge means operatively connecting said first lift support member to said lift;
a second lift supporting member positioned on said base below said lift, adapted to support compressional loads thereon, and including load sensing means adapted for sensing compressional loads thereon;
extensible means operatively connected between said lift and said second lift supporting member;
means for effecting extension of said extensible means to extend the same, thereby to pivot the lift about said hinge means to tilt said vehicle; and
means for measuring loads on said first load supporting member and said second load supporting member from the load sensing means thereof and calculating the weight of said vehicle on said lift from the measurements.

3,910,365
FLUID PRESSURE ACTUATED NET WEIGHING DEVICE WITH PNEUMATIC TARING

Wesley F. Buchele, Ames, Iowa, assignor to Iowa State Research Foundation, Inc., Ames, Iowa

Filed Feb. 26, 1975, Ser. No. 553,300
Int. Cl.² G01G *23/14, 5/04*
U.S. Cl. 177—165 **5 Claims**



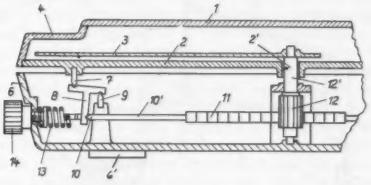
1. A fluid pressure-actuated weighing apparatus comprising:
a. a load cell including a vertically movable floating piston assembly, a cylinder unit for said piston assembly having an upper liquid chamber, and a lower air chamber, said chambers having vertically movable horizontal side walls interconnected by said piston assembly for movement with said piston assembly,
b. a fluid pressure-responsive weight indicating gauge connected to said upper liquid chamber,
c. a load supporting structure secured to said piston assembly for transfer of the weight of said supporting structure and a load supported thereon to the liquid in said upper chamber and to the air in said lower chamber,
d. a source of air under pressure, and
e. means for admitting air under pressure from said source to, or releasing air from, said lower air chamber, prior to the application of any load on said load supporting structure, whereby the air pressure in said lower air chamber is adjustable to offset the weight of said load supporting structure to effect a zero reading on said gauge,
f. said lower air chamber having a volume greater than the volume of said upper liquid chamber such that, in response to the application of a load on said load supporting structure the volume displacement thereof, relative to the volume displacement of said upper liquid chamber is of negligible value, whereby the reading on said gauge indicates the net weight of said load.

3,910,366
WEIGHING

Marc Terraillon, Gaillard, France, assignor to Terraillon, Annemasse, France

Filed Mar. 21, 1975, Ser. No. 560,738
Claims priority, application Switzerland, Apr. 24, 1974, 5601/74
Int. Cl.² G01G *3/00, 21/28*
U.S. Cl. 177—225 **4 Claims**

1. A weighing scales comprising
a. a base adapted to be disposed on a support surface,
b. an assembly including
1. a platform providing a standing surface for an individual to be weighed and
2. a support plate, said support plate and platform being mounted in spaced-apart relation,
c. a graduated scale disposed in an annular array on said support plate facing said platform,
d. index means supported for angular movement over said graduated scale,
e. means connecting said assembly and said index means, said connecting means being responsive to the weight of said individual thereby to translate axial movement of said assembly relative to said base to angular movement of said index means relative to said graduated scale,

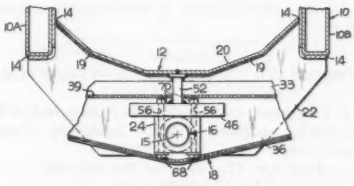


f. biasing means acting on said connecting means to oppose said axial movement of said assembly toward said base, and
g. at least the portion of said platform concentric with said array being formed of transparent material so that a scale reading determined by the angular position of said index may be obtained.

3,910,367
CRAWLER TRACTOR OSCILLATING BEAM MOUNTING

Gary A. Drone, Springfield, Ill., and James M. Schnepp, Mesa, Ariz., assignors to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

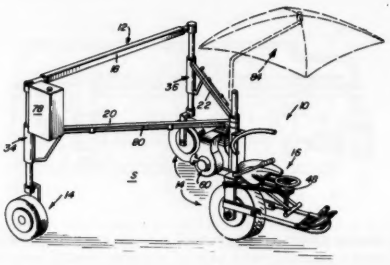
Filed May 10, 1974, Ser. No. 468,670
Int. Cl.² B62D *55/00*
U.S. Cl. 180—9.5 **9 Claims**



1. In a vehicle: an oscillating beam, and means for releasably mounting said beam on said vehicle comprising a mounting assembly connected to said vehicle and including a pair of vertically disposed support members spaced apart a predetermined distance to define a space open at the bottom and in which said beam is pivotably mountable, with opposite sides of said beam confronting said support members, pin means non-rotatably connected to said beam and having pin ends projecting from opposite sides of said beam, each pin end having a circular transverse cross section, the distance between the outer end surfaces of said pin ends being less than said predetermined distance but sufficient to prevent substantial axial shifting of said pin means, a bearing member removably supported on each pin end for pivotably supporting said beam on said mounting assembly, each bearing member having a circular bore therein for accommodating a pin end and by means of which said bearing member is removably supported on a pin end, said bore extending completely through said bearing member whereby the outer end surface of an associated pin end is adjacent an associated support member, bearing support means mounted on said mounting assembly between said support members, and connecting means for

releasably connecting each bearing member to said bearing support means of said mounting assembly.

3,910,368
RIDER FOR WEEDING SOYBEANS
John H. Weber, and John Roger Weber, both of Rte. 1, Anchor, Ill. 61720
Filed June 26, 1973, Ser. No. 373,623
Int. Cl.[2] B62D *61/08, 1/02*
U.S. Cl. 180—26 R **15 Claims**



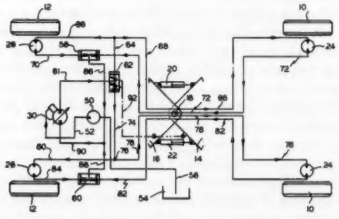
14. A vehicle, comprising, in combination:

a. a frame;

b. steerable means attached to the frame for permitting the frame to steerably traverse a supporting surface; and

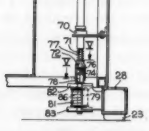
c. means actuatable in a plurality of different ways for controlling the steerable means, the steerable means including a pivotally mounted wheel, and the means for controlling being associated with the pivotally mounted wheel and including a handwheel means connected to the pivotally mounted wheel for turning same upon being selectively turned by an operator, a foot rest cantilever mounted to the pivotally mounted wheel and arranged for being selectively engaged by at least one foot of the operator to control direction of the pivotally mounted wheel, and a handle mounted on the foot rest and arrangeable for selective manipulation by the operator to lead the vehicle.

3,910,369
HYDROSTATIC TRANSMISSION SYSTEM FOR ARTICULATED VEHICLE
Willard L. Chichester, and Donald A. Holtkamp, both of Battle Creek, Mich., assignors to Clark Equipment Company, Buchanan, Mich.
Filed Apr. 12, 1974, Ser. No. 460,660
Int. Cl.[2] B60K *17/34*
U.S. Cl. 180—44 F **5 Claims**



1. In a hydrostatic power transmission system for a four-wheel drive articulated vehicle having first and second pairs of longitudinally spaced drive wheels and first and second pairs of hydraulic motors for driving respective pairs of said wheels, a fluid drive system comprising a closed loop drive circuit connecting said pairs of hydraulic motors including an engine driven variable displacement pump means, operator control means for controlling said engine and pump, and other control means in said drive circuit operatively connecting said pump to each of said motors including a main fluid flow divider means for dividing continuously in straight-ahead operation of the vehicle the fluid discharge of said pump means by volume substantially one-half each to said first and second pairs of motors at substantially pump discharge pressure, a first fluid flow divider means for dividing continuously under all conditions of straight-ahead vehicle operation the said first one-half fluid volume between the motors of said first pair of motors in a predetermined fixed proportion by volume and at substantially pump discharge pressure, and a second fluid flow divider means for dividing continuously under all conditions of straight-ahead vehicle operation the said second one-half fluid volume between the motors of said second pair of motors in a predetermined fixed proportion by volume and at substantially pump discharge pressure, whereby each drive wheel operates continuously for straight-ahead vehicle operation at a predetermined substantially fixed proportion of total fluid volume and substantially at pump discharge pressure irrespective of variations in surface traction as between any one of said wheels and any other wheel.

3,910,370
DISCONNECTING STEER SYSTEM
Clifford G. Mecklenburg, Homewood, and George J. Oakley, Glenwood, both of Ill., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Oct. 29, 1974, Ser. No. 518,789
Int. Cl.[2] E04G *1/18*
U.S. Cl. 180—77 R **15 Claims**



1. In a vehicle having a frame, a plurality of support wheels on said frame at least one of which is steerable and an operator's station elevatable from a lowered position on said frame to an elevated work position, the combination comprising:

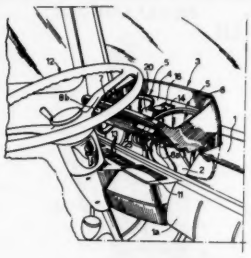
a steering control on said operator's station including a rotatable torque transmitting member;

a rotatable part on said frame steeringly connected to said steerable wheel and adapted for torque transmitting engagement with said torque transmitting member, said torque transmitting member and said rotatable part being engaged for rotary motion transmission when said operator's station is in its lowered position and being disengaged when said operator's station is elevated a predetermined distance from said lowered position.

3,910,371
INSTRUMENT PANEL FOR MOTOR VEHICLES

Guido Magrini, Brescia, Italy, assignor to Fiat Societa per Azioni, Turin, Italy

Filed July 31, 1973, Ser. No. 384,346
Claims priority, application Italy, Aug. 29, 1972, 69767/72
Int. Cl.[2] B60K *20/08*
U.S. Cl. 180—90 **4 Claims**

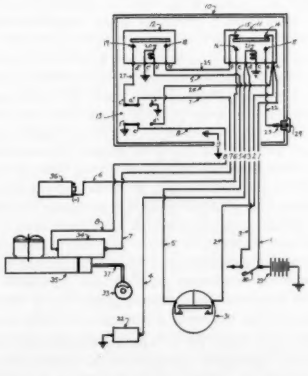


1. Instrument panel for motor vehicles of the type having a front wall extending across the width of the driver's cab and means for pivoting an instrument panel in a recess in said wall about an axis extending transversely of the vehicle behind the steering wheel, said instrument panel comprising a support housing having a base wall adapted to support a plurality of instruments having respective rear connections and a peripheral hood which surrounds the base wall and projects from it so as to screen the instruments from extraneous light, said housing being movable from a lowered normal position of use to a raised position giving access to the rear of the instruments and the respective connections thereto, said peripheral hood having a lower wall which projects towards the inside of the cab further than the remainder of the hood in the normal position of use of the panel, and said lower wall constituting a support for further instruments or electrical components which are not placed on said base wall.

3,910,372
AUTOMATIC ANTITHEFT LOCK FOR MOTOR VEHICLES

Morton Mozzar, 1018 Ardmore Road, Baldwin, N.Y. 11510

Filed Apr. 13, 1973, Ser. No. 350,994
Int. Cl.[2] B60R *25/08*
U.S. Cl. 180—114 **7 Claims**

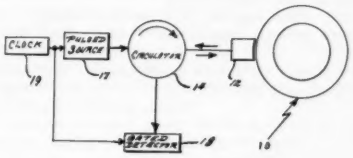


1. An anti-theft locking device for a motor vehicle having a hydraulic brake system and an ignition switch, the device comprising a double-pole, double-throw switch with each pole having a movable contact and two fixed contacts, said movable contacts being together movable between normal and off positions, one of the fixed contacts in the off position of a first one of said poles being grounded and one of the fixed contacts in the normal position of a second one of said poles being grounded to thereby ground the movable contact of said first pole only in the off position thereof and ground the movable contact of said second pole only in the normal position thereof; a brake solenoid valve cooperating with the vehicle hydraulic brake system and having a pair of electrical terminals each of which is connected to different ones of said movable contacts and through which reversible currents may be caused to flow, the direction of current flow determining the braking and releasing action of said valve, application of a voltage to one of said terminals resulting in locking of the brakes and application of a voltage to the other of said terminals resulting in release of the brakes; and actuation means connected to the ignition switch and to the other of the fixed contacts of said one pole for supplying a voltage from a battery to said one of said valve terminals only when the ignition switch is off and the brake is actuated and the movable contacts are in the normal position, the other of the other fixed contacts being connected to the battery for supplying a voltage at the other of said valve terminals when said movable contacts are in the off position.

3,910,373
ACOUSTIC ROTATION RATE SENSOR

Ronald G. Newburgh, Belmont, and Alan J. Budreau, Arlington, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 7, 1973, Ser. No. 413,729
Int. Cl.[2] G01K *11/00*
U.S. Cl. 181—.5 **1 Claim**

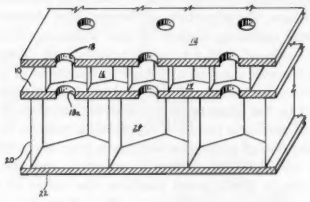


1. An acoustic rotation rate sensor comprising
an annular member of acoustic wave substrate material having an acoustic surface wave propagation surface there around, said annular member being in a fixed inertial frame and rotatable about its major axis,
transducer means in a fixed frame relative to rotation of said annular member and positioned separate from and in close proximity to the acoustic surface wave propagation surface thereof, said transducer means being adapted to generate, in response to an electromagnetic wave input, clockwise and counterclockwise acoustic surface waves on said acoustic surface wave propagation surface, and to generate first and second electromagnetic wave output signals in response to said clockwise and counterclockwise acoustic surface waves,
a source of electromagnetic wave energy connected to said transducer means, and
detector means connected to said transducer means adapted to process said first and second electromagnetic wave output signals as a measure of relative motion between said annular member and said transducer.

3,910,374
LOW FREQUENCY STRUCTURAL ACOUSTIC ATTENUATOR

Ian Holehouse, Bonita, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Mar. 18, 1974, Ser. No. 452,364
Int. Cl. B64d *33/06*
U.S. Cl. 181—33 G 4 Claims

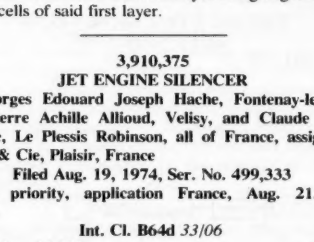


1. Acoustic cellular honeycomb sandwich which comprises a first sandwich layer of spaced cell honeycomb faced on the faying edges by foraminous skins, the orifices in each of said skins juxtaposed externally with respect to each of said honeycomb cells, a second layer of cellular honeycomb material the faying edges of one side thereof connected to one of said foraminous skins with the orifices of said one of said skins juxtaposed centrally with respect to said cells of said second layer, and said cells of said second layer being of greater width than the cells of said first layer.

3,910,375
JET ENGINE SILENCER

Jean Georges Edouard Joseph Hache, Fontenay-le-Fleury; Jean-Pierre Achille Allioud, Velisy, and Claude Charles Doyotte, Le Plessis Robinson, all of France, assignors to Bertin & Cie, Plaisir, France

Filed Aug. 19, 1974, Ser. No. 499,333
Claims priority, application France, Aug. 21, 1973, 73.30277
Int. Cl. B64d *33/06*
U.S. Cl. 181—33 HC 10 Claims

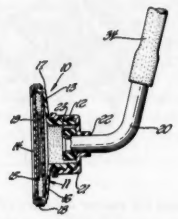


1. In and for a jet propulsion engine having a thrust nozzle adapted to exhaust a propulsive gas jet, said nozzle including wall means longitudinally bounding a hollow central body substantially coaxial with said nozzle, a silencer device for reducing the noise produced by said gas jet, said silencer device comprising means for supplying the inside of said hollow central body with air, and at least one orifice formed in said wall means and through which air from the inside of said hollow central body can discharge into the gas jet exhausting from said thrust nozzle, wherein the improvement comprises, hingedly connected to the central body, at least one adjustable obturating flap movable between a first position wherein it unmasks said orifice and a second position wherein it masks the same and restores a substantially unbroken surface to the longitudinal wall of the central body.

3,910,376
STETHOSCOPE

J. Leonard Azneer, 3000 Grand Ave. No. 217, Des Moines, Iowa 50312

Filed May 3, 1974, Ser. No. 466,705
Int. Cl.[2] A61B *7/02*
U.S. Cl. 181—131 3 Claims

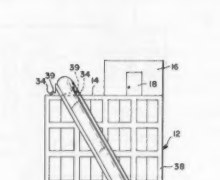


1. In a stethoscope comprising,
a. a housing containing at least two diaphragms therein in which each diaphragm is axially spaced from the other,
b. means for retaining said diaphragms within said housiing to enable axial movement of said diaphragms for producing sound waves, and
c. earpiece means for transmitting the sound waves to a listener, and
d. magnetic means on said diaphragms in which the magnetic means comprises a magnetized material secured to one diaphragm and a magnetically responsive material on the other diaphragm whereby one diaphragm is magnetically responsive to the movement of the other.

3,910,377
LIFE SAVING ESCAPE CHUTE

Theodore R. Zamorski, Elizabeth, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 8, 1974, Ser. No. 495,583
Int. Cl.[2] A62B *1/20*
U.S. Cl. 182—48 6 Claims

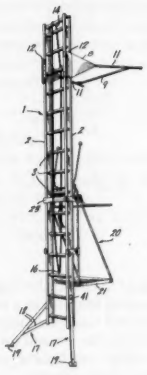


1. A fire escape chute for a building comprising an elongated metal slide having an elongated solid translucent plastic covering carried over substantially the entire length of the slide, said plastic covering engaging said metal slide along the edges thereof in sealing engagement to prevent entrance of smoke.

3,910,378
SCAFFOLD STRUCTURE

Curt Lennart Nyman, Billdalsgatan 24, Roras, Sweden

Continuation-in-part of Ser. No. 400,613, Sept. 25, 1973, abandoned, which is a continuation of Ser. No. 89,344, Nov. 13, 1970, Pat. No. 3,770,902. This application Dec. 5, 1973, Ser. No. 421,865
Int. Cl.[2] E06C 7/16
U.S. Cl. 182—103 18 Claims

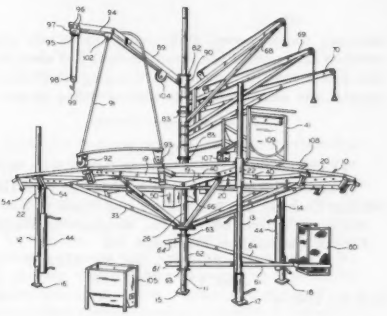


1. A scaffold structure comprising: a ladder assembly having a pair of juxtaposed and spaced-apart elongated support members, a plurality of rungs interconnecting said support members at a plurality of longitudinally spaced-apart locations, and means connected to said support members for maintaining said ladder assembly in a substantially vertical orientation during use so that said support members extend in a generally vertical direction comprising two arms extending outwardly from said support members and lying in a plane generally perpendicular to that of said support members, means mounting said arms on said support members for sliding movement along substantially the whole length of said support members comprising a first pair of connecting members each disposed about and slidable along the outboard side of respective ones of said support members and connected to one of said arms and means including a connecting rod interconnecting both connecting members, and manually actuatable means for effecting movement of said arms along the length of said support members; and a vertically positionable platform assembly movably connected to said ladder assembly for vertical movement therealong and defining therewith a scaffold structure, said platform assembly comprising a base portion extending outwardly from said support members in the same direction as said arms and dimensioned to accommodate thereon a standing person when said ladder assembly is vertically orientated, means movably connecting said platform asembly to said ladder assembly for movement therealong, locking means connected to said platform assembly and coacting with said rungs for releasably locking said platform assembly in a predetermined working position along said ladder assembly and comprising a pair of pivotally mounted locking members having at one end substantially flat end faces and means mounting said locking members for manual pivotal movement to a locking position wherein said flat end faces rest upon and bear against a common one of said rungs to thereby releasably lock said platform assembly in said working position and to an unlocking position wherein said flat end faces are free of said rungs to thereby permit movement of said platform assembly along said support members, and means engageable with a person ascending or descending said ladder assembly for effecting corresponding vertical ascending or descending movement of said platform assembly along said support members; whereby said platform assembly may be vertically moved and positioned along said ladder assembly by the ascending or descending movement of a person along said ladder assembly.

3,910,379
SYSTEM FOR CONSTRUCTION OF MONOLITHIC CONCRETE TANKS AND SILOS

Robert E. Miller, 1210 Pippin Court, and Thomas E. Miller, 480 E. Maple Lane, both of Mequon, Wis. 53092

Filed Nov. 30, 1973, Ser. No. 420,610
Int. Cl.[2] E04G 1/36, 9/00
U.S. Cl. 182—128 17 Claims



1. A scaffold mechanism for constructing a cylindrical building such as a concrete silo comprising in combination:

a horizontal generally circular platform means for distributing construction ingredients to the circular wall of a silo being of a size with the edges extending close to the inner silo wall;

a plurality of peripherally located ground supported vertical mast means for positioning immediately adjacent the inside of the circular wall for supporting the weight of said platform means within said wall;

lateral stabilizing means at the edge of the platform for engagement with the silo wall; said mast means laterally supported with lateral support afforded by engagement of said lateral stabilizing means;

fluid pressure operated power elevation means for incrementally raising said platform means mounted on said mast means;

and locking means independent of said power means for supportingly locking said platform means to said mast means between operation of said power means.

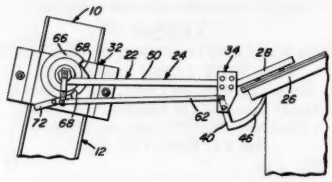
3,910,380
LADDER WITH CLAMP EQUIPPED WALL ENGAGING BRACKET

Alfred E. Nameche, 407 N. West St., Lima, Ohio 45801

Filed Dec. 2, 1974, Ser. No. 528,932
Int. Cl.[2] E06C 1/36
U.S. Cl. 182—206 10 Claims

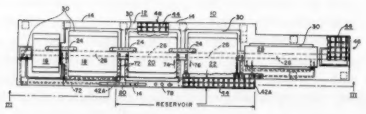
1. A ladder support bracket assembly, said assembly including elongated support arm means, mounting means for attachment to the upper end of a ladder to be leaned toward and supported from a support structure, said mounting means including pivot means pivotally supporting one end of said support arm means from said mounting means for swinging about a horizontal axis, said mounting means including mounting structure for support from an associated ladder including opposite side rails with said horizontal axis extending transversely of said rails and generally paralleling a plane containing said rails, the free end portion of said arm means including first jaw means and second movable jaw means

shiftably supported from said arm means and with said second jaw means including at least portions thereof shiftable toward and away from said first jaw means to clamp said support



structure therebetween, shift means operatively connected between said second jaw means toward and away from said first jaw means in response to swinging oscillation of said support arm means relative to said mounting means.

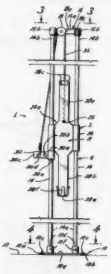
3,910,381
LUBRICATING OIL SYSTEM INTEGRAL WITH STRUCTURAL STEEL TURBINE FOUNDATION
Michael Csanady, Jr., Ridley Park, and Frank O. Burckhalter, Newtown Square, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed May 28, 1974, Ser. No. 473,960
Int. Cl.[2] F01M *5/00*
U.S. Cl. 184—6 **8 Claims**



1. The steam turbine power plant comprising:
a foundation supporting thereon a steam turbine element, said foundation being fabricated of structural steel box beams, said box beams providing a storage volume therein,
a lubrication system for said turbine element disposed integral with said foundation,
a first and a second stiffener member disposed within said box beam foundation, said stiffener members defining a lubricant reservoir within said storage volume, a supply of fluid lubricant being disposed within said reservoir defined between said stiffener members.

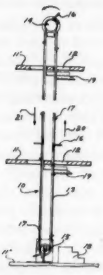
3,910,382
RIFLE LIFT
Jerry Patton Justice, 2168 Warwick St., Houston, Tex. 77016
Filed July 5, 1974, Ser. No. 485,792
Int. Cl.[2] F41C *29/00*
U.S. Cl. 187—1 R **9 Claims**

1. A rifle lift for safely transporting a rifle between the ground and a hunting stand, comprising:
a base member adapted to be positioned on the ground;
elongated guide members affixed to and extending upwardly from said base member, each of said elongated guide members being substantially parallel to one another;
a top member attached to said guide members and adapted to be positioned adjacent the hunting stand;
a rifle support means for releasably holding the rifle in an upright, safe position;
sleeve means mounted with said rifle support means for mounting said rifle support means for slidable movement along said guide members;
said rifle support means including a rifle support member for mounting said sleeve means in parallel alignment and



said rifle support member having outwardly extending arms for supporting the rifle in a position away from said guide members and said rifle support member; and,
means operated from the ground for moving said rifle support means along said guide members between the ground and the hunting stand.

3,910,383
MANLIFT
Vladimir Friedl, 3495 Ivan Franko, Lachine, Canada
Filed Apr. 22, 1974, Ser. No. 462,728
Int. Cl.[2] B66B *9/00*
U.S. Cl. 187—16 **16 Claims**



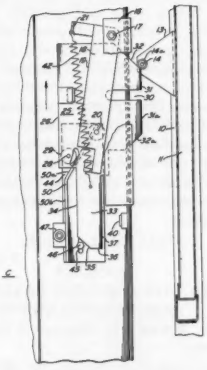
1. A manlift comprising a driven drum, a tension drum spaced vertically downwards of said driven drum, said tension drum having an annular guide flange in each side thereof and spaced inwardly of its outer circular periphery, means maintaining said tension drum in a horizontal plane, an endless belt trained about said spaced apart driven and tension drum, said endless belt having an upward travel and a downward travel on a respective opposed side thereof between said driven and tension drum, guide means adjacent each side edge of said endless belt and extending at least along said upward and downward travel, at least one tread support member rigidly secured to said endless belt transversely thereto, said tread support member having two spaced apart parallel side frames, a transverse securing bar connected at each its ends to a respective side frame, said securing bar being connected to

said endless belt, a support member secured between said parallel side frames and extending transversely and forwardly from said belt, and follower means secured at each end of each said parallel side frame for guided engagement with said guide means and for further guided engagement with a respective one of said annular guide flange in each side of said tension drum whereby to guide said tread support member about said tension drum and maintain said tension belt substantially centrally about a portion of said tension drum, said follower means being displaceably engaged adjacent each side edge of said endless belt in a respective one of said guide means for maintaining said support member vertically along a predetermined path, and holding means permitting a person standing on said tread support member to secure himself while being transported by said endless belt.

3,910,384
POWER OPERATOR FOR ELEVATOR SHAFT DOORS

John J. DeFeo, Blackwood, N.J., assignor to American Sterilizer Company, Philadelphia, Pa.

Filed Dec. 16, 1974, Ser. No. 532,768
Int. Cl.[2] B66B *13/12*
U.S. Cl. 187—52 LC **9 Claims**



1. Door operating mechanism for a vertically slidable hoistway door in an elevator hatchway having an elevator car therein with a vertically slidable car door comprising

an actuating member on said hoistway door engageable for effecting movement of said hoistway door,

a pivotally mounted vane support member carried by and movable with the car door,

a vane member pivotally mounted to said support member and movable to and from a position for engagement with said actuating member,

said vane member and said actuating member having interengageable portions for simultaneously moving said doors,

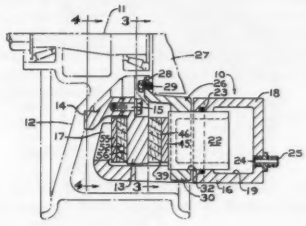
a cam member mounted on said car and with respect to which said vane support member and vane member are movable and having a portion for controlling the positioning of said vane member in one direction with respect to its engaged position, and

a resilient member connecting said vane member and said support member for controlling the positioning of said vane member in at least one direction with respect to its engaged position.

3,910,385
DISC BRAKE CALIPER AND MOUNTING STRUCTURE

Richard H. Gardner, Pleasant Hill, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 18, 1974, Ser. No. 462,026
Int. Cl.[2] F16D *55/224*
U.S. Cl. 188—73.3 **7 Claims**



1. A disc brake for braking engagement with a brake disc rotatable about an axis comprising a floating caliper member extending axially of said disc, an integral housing of said caliper member overlapping a first face of said disc, a radially extending flange of said caliper member overlapping an opposite second face of said disc, said housing having an axially extending cylinder, a nonrotatable mounting member having a cylindrical opening with the same diameter as and coaxial with said axially extending cylinder interposed between said housing and said disc, a piston having a cylindrical surface of the same diameter as said cylinder slidably disposed in said cylindrical opening and in sealing, sliding engagement with said cylinder providing a connection between said mounting member and said caliper member which is the only support of said caliper member, a first friction lining carrier having a friction lining for braking engagement with said first face of said disc slidably mounted on said mounting member and engageable by said piston, a second friction lining carrier having a second friction lining for braking engagement with said second face of said disc mounted on said radially extending flange of said caliper member, fluid pressure means, means to communicate fluid under pressure connected between said cylinder and said fluid pressure means for injecting fluid under pressure into said cylinder whereby said piston is urged in one direction against said first friction lining carrier and said caliper member, including said cylinder and radially extending flange, is urged in an opposite direction providing braking pressure against said second friction lining carrier and permitting sliding movement of said caliper on said piston to adjust for wear of said first and second friction linings.

3,910,386
QUICK INSTALLATION VEHICLE WHEEL SENSOR

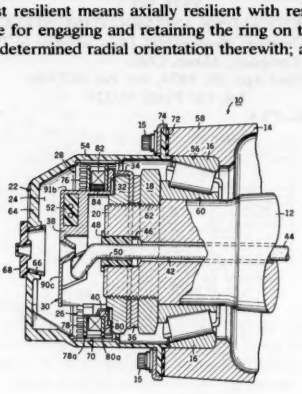
Donald R. Stigall, Glendale, and Richard C. Bueler, Des Peres, both of Mo., assignors to Wagner Electric Corporation, Parsippany, N.J.

Filed Sept. 23, 1974, Ser. No. 508,244
Int. Cl.[2] B60T *8/08*
U.S. Cl. 188—181 R **6 Claims**

1. In a vehicle wheel antilock system of the type including a wheel speed sensor, the sensor mounted on an axle adjacent at least one of the vehicle wheels, the sensor having a rotor and a stator and including a generally annular stator mounting ring carrying a first portion of a varying electrical signal generating means in cooperation with a second portion of the varying electrical signal generating means carried by the rotor, the improvement comprising:

retainer means mounted intermediate of the axle and the ring for engaging and retaining the ring on the axle in a predetermined radial and axial orientation therewith, the retainer including:

a. first resilient means axially resilient with respect to the axle for engaging and retaining the ring on the axle in a predetermined radial orientation therewith; and



b. second resilient means axially resilient with respect to the axle engaging and retaining the ring on the axle in a predetermined axial and radial orientation and for axially displacing the ring from the retainer for disengaging the first resilient means from a predetermined radial orientation with the axle.

3,910,387

HYDRAULIC DAMPERS

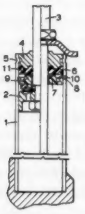
Lawrence George Nicholls, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Jan. 14, 1974, Ser. No. 433,372

Claims priority, application United Kingdom, Jan. 30, 1973, 4663/73

Int. Cl.² F16F *9/06*

U.S. Cl. 188—322 **4 Claims**



1. In an hydraulic damper including a tube having a first end and a second closed end, a liquid and a gas in said tube in contact with each other, a valved piston working in said tube and a piston rod secured to said piston and extending through the first end of said tube, the invention which comprises a piston rod guide secured in the extremity of the first end of said tube, a seal located axially inwardly of said guide and sealingly engaging said rod for preventing gas and liquid seepage along said rod, a seal support fixed in said tube, said support and seal having adjacent surfaces which mutually abut for supporting said seal, portions of said adjacent surfaces being shaped to define therebetween a reservoir which receives and stores liquid delivered thereto, and fluid passage means communicating said reservoir with said rod so as to supply liquid from the latter to said reservoir during use of said damper with its first end upright for maintaining said seal wetted during periods when said damper is temporarily not in use, said seal support being of resilient compressible plastic material to provide a resilient stop for said piston at the maximum extension of the damper.

3,910,388

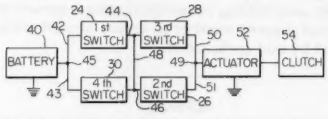
SHIFTER WITH SWITCHES FOR SEQUENTIALLY OPERATING A TRANSMISSION AND CLUTCH

Yooichi Moori, and Tooji Takemura, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Continuation-in-part of Ser. No. 386,401, Aug. 7, 1973, abandoned. This application May 14, 1974, Ser. No. 469,898

Int. Cl.² B60K *21/00*

U.S. Cl. 192—3.56 **2 Claims**



1. An electric control device to control a clutch of a power transmission having a gearshift lever movable to first, second, third and fourth gear positions, a neutral position and a reverse drive position, said device comprising, in combination, an electric power source, a first switch connected to said electric power source and cooperating with said gearshift lever, said first switch closing when said gearshift lever is moved in one direction, a second switch connected to said first switch and cooperating with said gearshift lever, said second switch closing when said gearshift lever is moved in another direction, a third switch connected in parallel with said second switch and cooperating with said gearshift lever, said third switch closing when said gearshift lever is moved to one of said second and third gear positions, said neutral position and said reverse drive position, a fourth switch connected in parallel with said first switch and cooperating with said gearshift lever, said fourth switch closing when said gearshift lever is moved to one of said first and third gear positions and said neutral position, and an electric actuator connected to said second and third switches to actuate said clutch of said power transmission.

3,910,389

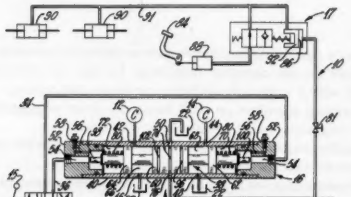
CONTROL FOR APPLYING BRAKE DURING TRANSMISSION SHIFTS

Walter J. Pleier, Bristol, Pa., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 2, 1974, Ser. No. 457,319

Int. Cl.² B60K *29/02*

U.S. Cl. 192—4 C **7 Claims**



1. A control system for automatically engaging a vehicle brake system during a vehicle transmission shift between forward and reverse vehicle direction comprising:

clutch means for engaging a vehicle transmission;

a brake system actuated by a pressure signal applied thereto;

a transmission shift control valve for establishing a control signal in response to a shift in said control valve between actual and desired vehicle direction;

anti-plug means connected to said clutch means, said transmission control valve, and to said brake system for controllably applying said pressure brake signal to said brake system in response to a control signal from said transmission control valve prior to engagement of said clutch means;

said anti-plug means including an anti-plug valve having a cylindrical valve body forming an enclosed annular cavity therein, connecting means for applying the control signal from said transmission control valve to the cavity of said cylindrical valve body, a vent outlet for discharging fluid from the cavity of said cylindrical valve body, and a movable valve spool member sealably located in the cavity of said cylindrical valve body to move in response to the control sigr.al from said transmission control valve between a first position wherein said brake pressure signal is connected to said vent outlet and a second position wherein said brake pressure signal is applied to said brake system; and

timing means for varying the time required for said spool member to move from said first position to said second position in response to the control signal from said transmission control valve, said timing means comprising a pair of passageways formed in an end of said cylindrical valve body for communicating the control signal between said connecting means and said movable spool member, a variable restrictor located between said pair of passageways, and a stepped stem member connected to an end of said movable spool member to provide a sequential blocking of at least one of said pair of passageways as said spool member moves in response to the control signal from said transmission control valve.

3,910,390
SYNCHRONIZING DEVICE FOR GEAR COUPLINGS IN CHANGE-SPEED GEARS

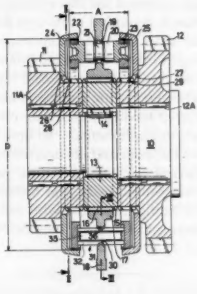
Johann Eichinger, Putzbrunn, Germany, assignor to Carl Hurth, Maschinen- und Zahnradfabrik, Munich, Germany

Filed Mar. 18, 1974, Ser. No. 451,844

Claims priority, application Germany, Mar. 28, 1973, 2315388

Int. Cl.² F16D *23/06*

U.S. Cl. 192—53 E **4 Claims**



1. A synchronizing device for selectively connecting an intermediate rotatable member positively to either of a pair of rotatable members located respectively adjacent the ends of the intermediate member, comprising:

means for shifting the intermediate member into coupling engagment with either of said pair of rotatable members;

a pair of axially spaced synchronizer ring means responsive to said shifting means for producing synchronization of either of the said pair of rotatable members with the said intermediate member before engagement is made between them; and

additional means for rendering said synchronizer ring means effective when movement of said intermediate member is initiated from a neutral position, said additional means including (1) plural split pin devices extending between said pair of axially spaced synchronizer ring means, said plural split pin devices each including a centrally located annular groove therein, the edges of said annular groove being engaged by said shifting means when shifting is initiated from said neutral position and (2) solid pin devices extending between said pair of axially spaced synchronizer ring means, said solid pin devices including a centrally located annular groove therein, the edges of which are engaged by said shifting means when shifting is initiated from said neutral position, the ratio of the outer diameter (D) of said pair of synchronizer ring means to the axial spacing (A) between the oppositely axially facing sides of said pair of synchronizer ring means being greater than 3.

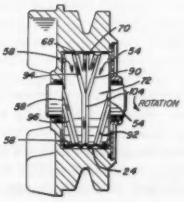
3,910,391
PULLEY ASSEMBLY

Rodney H. Detty, Battle Creek, and Wayne K. Leichliter, Marshall, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 13, 1974, Ser. No. 450,665

Int. Cl.² F16D *35/00*; **F01P** *7/02*

U.S. Cl. 192—58 B **10 Claims**



1. An assembly comprising a rotatable pulley body which at least partially defines a central working chamber for holding a fluid shear medium, said pulley body including outer surface means defining a circular groove for receiving a flexible drive member which is movable to rotate said pulley body, a rotor disposed in said working chamber and adopted to be connected with an output shaft for rotation about an axis, first shear surface means disposed on said pulley body, second shear surface means disposed on said rotor and cooperating with said first shear surface means to define a shear space between said rotor and pulley body for receiving the fluid shear medium to thereby transmit torque between said pulley body and rotor upon rotation of said pulley body by the flexible drive member, said second shear surface means including an annular outer generally cylindrical peripheral surface on said rotor, said annular outer peripheral surface including a circular central portion and a pair of circular axially outer side portions disposed on opposite sides of said central portion, and groove means disposed in said side portions for inducing a flow of the fluid shear medium from said side portions of said outer peripheral surface toward the central portion of said outer peripheral surface.

3,910,392
CLUTCHES WITH SPRING WIRE TORQUE TRANSMITTING MEMBERS

John Arthur Foers, Braithwell, near Rotherham, England, assignor to GKN Transmissions Limited, Birmingham, England

Filed Dec. 28, 1973, Ser. No. 429,354

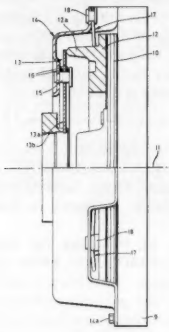
Claims priority, application United Kingdom, Jan. 2, 1973, 200/73

Int. Cl.² F16D *13/50*, *13/68*

U.S. Cl. 192—70.18 **11 Claims**

1. An assembly for use in a friction clutch comprising:

a. a cover,
b. a pressure plate,
c. spring means for urging the pressure plate relatively axially of said cover from a clutch disengaged position to a clutch engaged position,



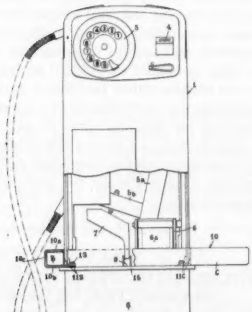
d. torque transmitting means interconnecting said cover and said pressure plate and including a plurality of torque transmitting members formed of spring wire, said spring wire torque transmitting members being the only means for transmitting rotational torque from the cover to the pressure plate in a clutch disengaged position.

3,910,393

COIN TELEPHONE ANTI-JIMMY CABINET

Edouard de Crepy, Paris, France, assignor to Societe Anonyme Francaise des Appareils Automatiques, Taximetres-Taxiphones "SAFAA", Paris, France

Filed Apr. 8, 1974, Ser. No. 459,076
Claims priority, application France, Apr. 9, 1973, 73.12678
Int. Cl.[2] G07F *9/00*
U.S. Cl. 194—1 B **1 Claim**



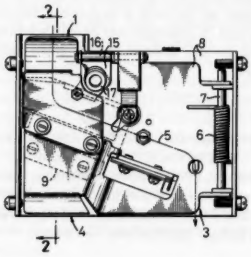
1. Coin-operated apparatus comprising a cabinet enclosing the complete equipment and having a lock, and a coin-box, said cabinet and coin-box being secured in superposed relationship to each other to a common wall support, said coin-box having an inlet orifice formed in its top face, a chute disposed within said cabinet so that coins fall from the lower end of said chute into said inlet orifice, the lower face of said cabinet and the top face of said box being relatively close to each other and having their joint plane protected from all external sides by at least one belt plate of high tensile strength metal counteracting any attempt to insert a breaking tool into the corresponding joint plane said metal belt projecting from three outer sides of said cabinet and being substantially at the level of the joint plane, and comprising at least one free space permitting the fall of coins into the inlet orifice of said box, the top face of said plate being adapted to act as a tray facilitating the use of the apparatus, said plate being hollow and consisting of relatively thick sheet-metal elements constituting a frame having only three sides, and the two lateral sides of said frame comprising internal means for detachably fastening said frame to the lower lateral edges of the cabinet of the apparatus, said fastening means being accessible only from within said cabinet, after opening said lock.

3,910,394

APPARATUS FOR SELECTING COINS

Takeshi Fujita, Higashi-Osaka, Japan, assignor to Daiwa Seiko Co., Ltd., Japan

Filed Sept. 29, 1972, Ser. No. 295,987
Int. Cl.[2] G07F *3/02*
U.S. Cl. 194—97 R **2 Claims**



1. In an apparatus for selecting coins by detecting the peripheral milled edge of the coin and the diameter of the coin wherein a passage adapted for the rolling passage of coins in an upright position is provided at its one side with a tumbling window narrower than the outer diameter of a genuine coin including the projections of the milled edge thereof characterized by a support pin disposed at one side of said passage above said window and having a circular section and an annular selecting member having a precisely circular pin bore and a milled periphery complementary to and in conformity with the milled edge of the coin and eccentrically loosely supported on said pin to permit part of the milled periphery to project from said window continuously, the milled periphery of said selecting member being meshable with the milled edge of the genuine coin when said selecting member is in its uppermost elevated position.

3,910,395

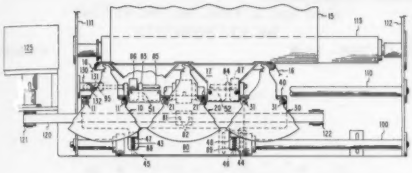
APPARATUS FOR PRINT HEAD RETRACTION TO FACILITATE PAPER INSERTION

Donald F. Colglazier, Lexington, Ky., and Gordon W. Westphal, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1974, Ser. No. 448,788
Int. Cl.[2] B41J *3/10*
U.S. Cl. 197—1 R **9 Claims**

2. In a line printer having a carriage moveable along a carriage path relative to the print line from a home position located at one extreme end of said carriage path to a return position located at another extreme end of said carriage path and back to the home position, the improvement comprising: printing element support means moveably mounted to said carriage to move toward and away from said print line,

actuator means for moving said support means toward and away from said print line, said actuator means normally holding said support means toward said print line, and



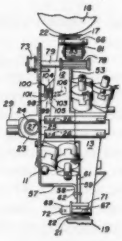
operator means for operating said actuator means to move said support means away from said print line when said carriage is in said home position and to move said support means toward said print line when said carriage leaves said home position.

3,910,396

BUSINESS MACHINE PRINTER HAVING PLURAL PRINT HEADS

Albert L. Eischen, Arlington Heights, and George Kolomayets, Chicago, both of Ill., assignors to Victor Comptometer Corporation, Chicago, Ill.

Filed Apr. 17, 1974, Ser. No. 461,606
Int. Cl.[2] B41J *3/42, 19/72, 29/10, 33/10*
U.S. Cl. 197—5 5 Claims



1. A business machine printer comprising: a pair of platens comprising upper and lower vertically separated horizontal printing surfaces for backing associated record receiving media, inking means, a carriage, drive means for moving said carriage horizontally relative to said platens, and a pair of vertically opposing print heads mounted in back-to-back relationship on said carriage, each of said print heads having a set of selectively movable printing elements cooperable with said inking means to impactingly print on the medium associated with one of said platens.

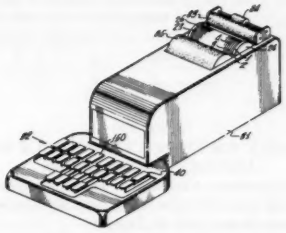
3,910,397

STENOGRAPHIC BRAILLE MACHINE

Betsey J. Harding, 12741 Newport Ave., Tustin, Calif. 92680

Filed July 24, 1973, Ser. No. 382,178
Int. Cl.[2] B41J *3/32*
U.S. Cl. 197—6.1 5 Claims

1. An apparatus for recording visual and tactual information comprising:
a keyboard having a plurality of keys;
a cylindrical platen;
means for journalling said platen so as to permit rotation about the axis of the cylinder;
a plurality of cylindrical disks each journalled for rotation about an axis parallel to the axis of said cylindrical platen;
linkage means responsively connecting each of said keys with one of said disks so as to cause said disks to rotate when the associated key is struck;
means responsive to each key for rotating said platen each time that a key is depressed;
and ratchet clutch means for disengaging said disks and said platen when said key is released whereby said disk and platen will remain in the position effected when said key is fully depressed;
a plurality of embossing heads on the circumference of each of said disks;



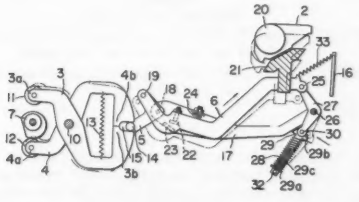
means for feeding a pressure sensitive recording medium between said platen and said disks;
means for positioning the journalled axis of each of said disks so as to cause said embossing heads to exert pressure on the recording medium when said disk and platen are rotated by the depression of a key.

3,910,398

CARRIAGE SHIFT MECHANISM FOR AN ELECTRIC TYPEWRITER

Toshihiro Kubota, and Toshikatu Terashima, both of Sakakimachi, Japan, assignors to Nakajima All Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1974, Ser. No. 474,689
Claims priority, application Japan, Nov. 19, 1973, 48-129977
Int. Cl.[2] B41J *11/14, 25/08, 25/24*
U.S. Cl. 197—73 5 Claims



1. In a typewriter of the class having a source of rotary power, a drive shaft coupled to the source of rotary power to be thereby driven in constant rotation, and a carriage capable of being selectively moved between raised and lowered positions, a carriage shift mechanism comprising, in combination: shift key means;
a cam mounted on the drive shaft to be rotatable relative to the drive shaft and normally held stationary independently of the rotation of said drive shaft;
means actuated by said shift key means to permit said cam to undergo rotation through a prescribed angle together with said drive shaft;
cam follower means actuated by said cam upon its rotation through said prescribed angle;
linkage means actuated by said cam follower means to impart up-and-down motion to said carriage, said linkage means comprising a pair of levers in scissor-like crossed arrangement pivotably connected at central parts thereof

and having respective first ends located on opposite sides of said cam to form said cam follower means, said levers having opposite second ends resiliently urged into contact with each other, said second ends being partly recessed to define a slot therebetween, and link means having an end with a pin thereon slidably received in said slot, said link means being connected at its other end to said carriage; and

toggle joint means coupled to said other end of said link means to assist the up-and-down motion of said carriage, said toggle joint means being effective to selectively hold said link means and hence said carriage securely in said raised or lowered positions.

3,910,399

REVERSIBLE INK RIBBON FEED DEVICE HAVING UNITARY BULK SENSORS

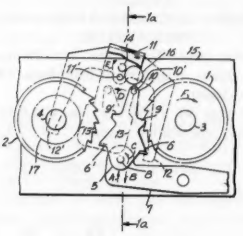
Tadayoshi Shimodaira, Matsumoto, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, Suwa, both of, Japan

Filed July 19, 1973, Ser. No. 380,646

Claims priority, application Japan, July 19, 1972, 47-72223; Aug. 23, 1972, 47-83639

Int. Cl.[2] B41J *33/512*

U.S. Cl. 197—161 **7 Claims**



1. An ink ribbon feeder for a printer comprising a base, a pair of spaced, coplanar means rotatably mounted on said base for intermittently rotating a pair of ink ribbon reels, oscillatable means alternately coacting with each of said pair of rotatably mounted spaced, coplanar means for selectively intermittently advancing one or the other of said rotatably mounted, spaced coplanar means, reciprocable means pivotally connected to said oscillatable means for reciprocating said oscillatable means for thereby intermittently advancing one of said rotatably mounted, spaced, coplanar means, a pivotally mounted detect lever for sensing a predetermined unreeled quantity of ink ribbon on an ink ribbon reel and for shifting said oscillatable means into position for intermittently rotating said other of said rotatably mounted, spaced, coplanar means, said detect lever including an elbowed member having an expanded neck portion provided with ink ribbon sliding surfaces, and means for oppositely biasing said ink ribbon detect lever and said oscillatable means, said detect lever including a pair of coplanar branched arms, each arm terminating in a finger for engaging opposite sides of said oscillatable means for thereby shifting said oscillatable means into engagement with one or the other of said pair of rotatably mounted spaced, coplanar means.

3,910,400

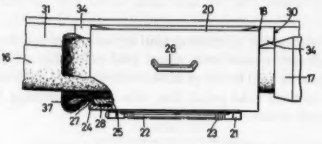
DEVICE FOR CLEANING MOVING BALUSTRADE BELT

Kinue Hishitani, No. 5-10, Irie, Aza Shimono-ike, Nishino, Itami, Hyogo, Japan

Filed Apr. 2, 1974, Ser. No. 457,341

Int. Cl.[2] B65B *9/12*

U.S. Cl. 198—16 R **4 Claims**



1. A safety and cleaning device for cleaning the moving handrail on the sidewall of an escalator and the like and for preventing objects from entering into the body of said escalator where said moving handrail enters into said escalator body, said device comrising:

wiper means in contact with said moving handrail for cleaning said handrail;

compartment means surrounding and spaced from said moving handrail and removably secured to said escalator sidewall for containing said wiper means in contact with said moving handrail, said compartment means having open ends for allowing said moving handrail to pass therethrough and located at the position where said moving handrail enters into said escalator body;

fastening means attached to said escalator sidewall for receiving and securing said compartment means surrounding said handrail to said escalator sidewall, whereby said compartment means can be attached around and removed from around said handrail; and

safety means attached to said wiper means, extending out of said compartment means in the direction opposing the motion of said moving handrail, and filling the space between said compartment means and said moving handrail, thereby preventing objects from entering said escalator body and getting caught between said moving handrail and said compartment means.

3,910,401

DEVICE FOR COUNTING AND GROUPING SUBSTANTIALLY PIN-SHAPED PRODUCTS DURING TRANSPORT

Cornelis Sol, Westzaan, Netherlands, assignor to Van Der Molen Machinefabriek B.V., Zaandam, Netherlands

Filed Mar. 12, 1974, Ser. No. 450,387

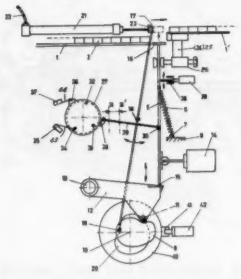
Claims priority, application Netherlands, March 26, 1973 7304165.

Int. Cl.[2] B65G *47/22, 47/52*

U.S. Cl. 198—24 **9 Claims**

1. A device for counting and grouping substantially pin-shaped products during transport comprising a transport track, a first pusher movable at right angles with respect to said transport track for removing upwardly a product to be counted from said transport track, a counting mechanism coupled to said first pusher, an accessory transport track, a shoving element operating parallel to said transport track adapted to transfer the product lifted from said transport track on to said accessory transport track, a second pusher also operating parallel to said transport track for moving a prede-

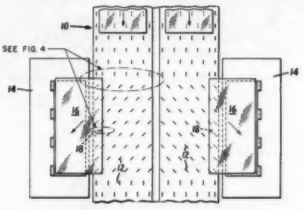
termined number of products over a certain distance along said accessory transport track, synchronically operating driving means for both said pushers and said shoving element for selectively coupling said first pusher to its driver.



3,910,402
ROUTING AND CONVEYING APPARATUS

George A. Dean, Kansas City, Mo., assignor to Dean Research Corporation, Kansas City, Mo.

Filed Mar. 12, 1973, Ser. No. 340,330
Int. Cl.[2] B65G *43/00*
U.S. Cl. 198—38 12 Claims

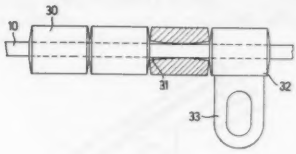


1. Apparatus for conveying and selectively routing one or more sheets of glass material comprising a plurality of modules each having a plurality of roll assemblies therein, each roll assembly having a plurality of rolls therein, each roll having a surface or portion of which extends upwardly from the roll assembly; and means for driving said rolls and for preventing bits of glass from interfering with the driving means comprising a shaft; a plurality of friction belt means mounted on said shaft and on each said roll assembly, said friction belt means being below the exposed surface of said roll, and means for providing driving power being external to said roll module; at least one output station positioned along a side of said device; and means for moving each of said roll assemblies through a preselected arc to change the direction of movement of said sheets to feed said sheets to said at least one output station.

3,910,403
CONVEYER SYSTEM

Paul Morsbach, Martinsholzerstrasse 13, 8131 Aufkirchen, and Hubert Strobl, Fasanenstrasse 82, 8025 Unterhaching, both of Germany

Filed Sept. 10, 1973, Ser. No. 396,099
Claims priority, application Germany, Sept. 14, 1972, 2244979
Int. Cl.[2] B65G *17/00*
U.S. Cl. 198—130 2 Claims

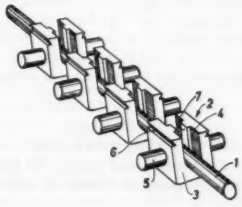


1. A conveyor system comprising
a. a circulating conveying and carrying element having a generally round cross-section,
b. support means operatively associated with said circulating element to define a predetermined conveying path thereof;
c. means for attaching loads to said circulating element; and
d. a plurality of carrier bodies each having an opening to receive and surround said circulating element, at least one of said carrier bodies being provided with said means for attaching loads to said circulating element, said carrier bodies having a generally cylindrical shape and being arranged to substantially cover said circulating conveying element so as to form a substantially continuous flexible sleeve composed of a substantially continuous sequence of said carrier bodies, at least some of said bodies each having a convex head end portion and a concave tail end portion, each of said end portions having a substantially spherical shape, said bodies being arranged on said circulating element in a substantially continuous head-to-tail sequence.

3,910,404
CONVEYING MEANS

Ulf Henrekson, Fridhemsgatan 17, S-442 00 Kungalv, Sweden

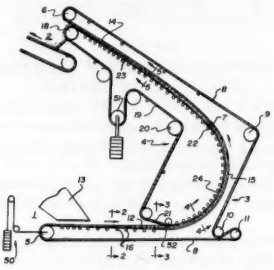
Filed Feb. 28, 1974, Ser. No. 446,930
Claims priority, application Sweden, Mar. 1, 1973, 7302873
Int. Cl.[2] B65G *17/00*
U.S. Cl. 198—130 1 Claim



1. A conveyor comprising a single flexible resilient cable provided with a plurality of spaced u-shaped resilient members securely affixed thereto and adapted to receive means on the open end of each said member for providing a conveying surface, said u-shaped member being in the form of a trough having on each side thereof an inwardly extending central portion adapted to grip said cable in frictional engagement, said members being further provided with opposed pins extending outwardly from each side thereof and transversely with respect to said cable, driving means comprising a pair of power operated wheels having slots to engage respectively the

opposed pins on said u-shaped members, and means for guiding said members in a continuous manner.

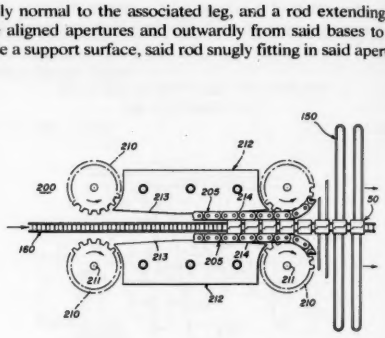
3,910,405
CONVEYOR APPARATUS
Egbert Couperus, Belleville, and Anthony D. Janitsch, Carrying Place, both of Canada, assignors to Borg-Warner (Canada) Ltd., Oakville, Canada
Continuation of Ser. No. 368,420, June 8, 1973, abandoned. This application July 15, 1974, Ser. No. 488,398
Int. Cl.[2] B65G *15/14*
U.S. Cl. 198—163 **1 Claim**



1. Apparatus for conveying loose bulk material from one level to a higher level, comprising inner and outer endless belt conveyors extending between respective pairs of supporting pulleys disposed at the respective levels and providing for each conveyor a forward run and a return run, and automatic tensioning means connected respectively to the belt conveyors for maintaining each belt conveyor in a state of tension; the forward run of said outer belt conveyor including an upwardly facing substantially horizontal entry portion, a downwardly facing upwardly inclined terminal portion, and a concavely curved intermediate portion; the forward run of said inner belt conveyor including a downwardly facing entry portion defining with a portion of said entry portion of said outer belt conveyor a bight between the conveyor belts to receive material therebetween and be elevated thereby, an upwardly facing, upwardly inclined terminal portion terminating at the higher level, and a convexly curved intermediate portion, said intermediate and terminal portions of the inner belt conveyor being carried by a support means, said inner belt conveyor having a stiffness greater than that of said outer belt conveyor; longitudinal raised edge portions on said inner belt in sealing engagement with the edges of said intermediate portion of said outer belt conveyor; and a plurality of raised cross cleats on said inner belt conveyor extending transversely between said raised edge portions, said cross cleats being of less height than said edge portions and herringbone in shape.

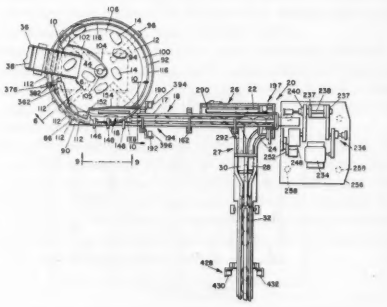
3,910,406
TWO-PART CLIP
W. O. Pulver, Hinsdale, and Robert W. Owens, Blue Island, both of Ill., assignors to Velten & Pulver, Inc., Chicago Ridge, Ill.
Filed Sept. 26, 1973, Ser. No. 400,952
Int. Cl.[2] B65G *17/00*
U.S. Cl. 198—189 **19 Claims**

1. An assembly for providing a support surface for carrying goods and the like on an articulated roller chain conveyor having a plurality of links joined together by connecting pins having the outer ends thereof protruding laterally beyond the links, said assembly comprising a two-part clip with each part having a base and a leg depending therefrom, each of said legs having an inner surface with a socket therein for receiving the outer end of an associated connecting pin, each of said bases having an aperture therein extending in a direction substantially normal to the associated leg, and a rod extending into the aligned apertures and outwardly from said bases to provide a support surface, said rod snugly fitting in said apertures



and frictionally maintaining said bases together with said legs in engagement with the associated connecting pin, a plurality of said assemblies mounted on the roller chain providing a conveying surface for transporting articles.

3,910,407
CLOSURE HANDLING AND ORIENTING APPARATUS
Walter S. Sterling, Quincy, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.
Division of Ser. No. 93,554, Nov. 30, 1970, Pat. No. 3,706,368. This application Dec. 18, 1972, Ser. No. 315,996
Int. Cl.[2] B65B *47/24*
U.S. Cl. 198—268 **12 Claims**

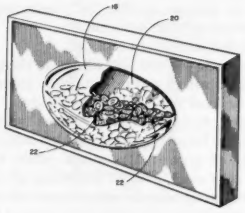


1. Closure handling and orienting appratus adapted to handle oblong closures having a reflective spot disposed on one side or the other of a longitudinal center line of the closure, means through which the closures are advanced to form a continuous line of closures, wherein some of the closures have a reflective spot on one side and others on the other side of said longitudinal center line, means for advancing the line of closure at a uniform rate, means for detecting the position of the reflective spot on successive closures, means responsive to said detecting means for distributing the closures having the reflective spots on different sides of the center line into two different paths, means for releasing the closures alternately from each path to provide a single line, means for rapidly advancing each closure to join the trailing end of said single line, means for detecting an extension of said trailing end toward said releasing means, and means for rendering said first means inoperative.

3,910,408
COIN DISPLAY CASE

Sy Husney, and Norman G. Little, both of Las Vegas, Nev., assignors to Sy's, Inc., Mr. Sy's, Las Vegas, Nev.

Filed July 30, 1973, Ser. No. 383,897
Int. Cl.[2] B65D *25/54*; A45C *1/12*
U.S. Cl. 206—.81 10 Claims



1. An inner wall having a reflecting mirror surface for reflecting articles in said case,

a front panel disposed forwardly of said inner wall having an opening therein,

a substantially smooth surfaced and transparent convex outer wall contacting said front panel around said opening and extending outwardly therefrom,

a bottom article support member elevated at a position between a frame member bottom and up to and including said front panel opening,

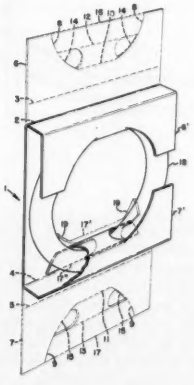
a frame member having a top, bottom, back and sides in which said front panel, bottom article support member and inner wall are received,

said outer wall, inner wall, and bottom article support member forming a chamber for holding articles therein.

3,910,409
CIRCLINE LAMP CARTON

Donald J. Fortlage, South Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 2, 1973, Ser. No. 384,980
Int. Cl.[2] B65D *85/42*
U.S. Cl. 206—303 4 Claims



1. A self-locking carton for packaging a fragile article of toroidal shape comprising:

a rectangular piece of flat stock having at each end two spaced score lines extending transversely from side edge to side edge to provide raised fold-over flaps at opposite ends;

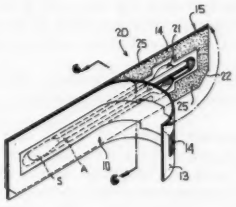
said flaps having inner and intermediate score lines extending parallel to the outer edge up to arcuate cuts extending from the inner score line to the outer edge, said arcuate cuts corresponding approximately to the inner curvature of said toroidal article, small sections of stock being removed between the inner and intermediate score lines next to the arcuate cuts to form T-shaped locking tabs foldable out of said flaps;

said article being laid flat on the stock forming the bottom panel, the flaps being progressively folded over through two right angles to provide top panel portions and the tabs being further folded in through two additional right angles with the ends tucked under the article to lock article and carton together.

3,910,410
RESEALABLE PACKAGE

Fred B. Shaw, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Mar. 19, 1974, Ser. No. 452,539
Int. Cl.[2] B65D *75/36*, *75/26*
U.S. Cl. 206—363 8 Claims

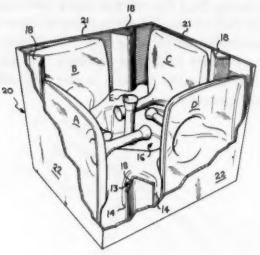


1. A resealable package particularly adapted for medical use comprising a tray formed of a first material, said tray having at least one cavity, said cavity being defined by a bottom wall and a peripheral wall, said peripheral wall being completely bounded by a peripheral flange, at least one article housed within said cavity, a lid closing said cavity, a first coating of pressure-sensitive adhesive covering substantially the entirety of said lid, a second coating of heat sealable material covering substantially the entirety of said first coating, said second coating being non-tacky and compatibly heat sealable to the material of said tray, a heat seal area bonding said second coating of said lid outboard of said peripheral wall to said peripheral flange, a non-heat sealed area inboard of said heat sealed area, the bond strength in the area of said heat seal between said peripheral flange and said second coating as well as between said first and second coatings being greater than the bond strength in the area of said heat seal between said first coating and lid whereby upon relatively opening said lid and tray said first coating delaminates from said lid in the area of said heat seal and is retained upon said peripheral flange for subsequent pressure resealing with said lid, and the bond strength in said non-heat sealed area between said lid and first coating and between said first and second coatings being greater than the tear strength of said first and second coatings whereby both said first and second coatings in said non-heat sealed area are retained by said lid upon said relative opening of said lid and tray.

3,910,411
PACKAGE ASSEMBLY

Thomas J. Deeren, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 25, 1972, Ser. No. 291,944
Int. Cl.[2] B65D *81/06, 85/30, 85/42*
U.S. Cl. 206—422 1 Claim

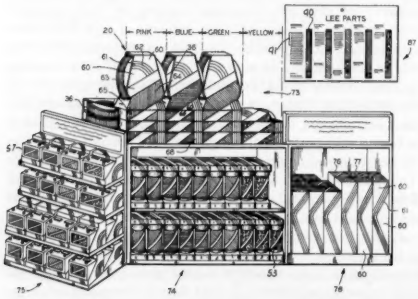


1. A package assembly comprising in combination:
a. an outer wrapper; and
b. a separator, said separator positioned within said wrapper, said separator having a plurality of shaped areas formed in each side wall of the separator, the shaped areas being the convex mating shape to a portion of a bulbous television bulb, the separator having a plurality of notches formed in the side walls of the separator;
c. said separator having a depression in the top thereof, said depression having a bottom panel having an opening therein;
d. a plurality of stiffening members, said members positioned in the notches of the separator;
and
e. said separator positioned within said outer wrapper whereby a concave area of the separator and a wall of the wrapper position a television bulb in the concave area and the stiffening members, positioned in the notches, resist downward depression of the assembled package.

3,910,412
POINT OF SALES PACKAGING AND DISPLAY SYSTEM

John W. Vargo, Cleveland, Ohio, assignor to Filter Dynamics International, Inc., Cleveland, Ohio

Filed Mar. 8, 1973, Ser. No. 339,322
Int. Cl.[2] B65D *73/00*
U.S. Cl. 206—459 9 Claims

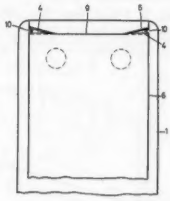


1. A packaging system comprising a plurality of groups of cartons with different products in the different groups,
each of said groups of cartons being arranged into subgroups with different species of said products in said subgroups,
each carton having at least four sides with printing thereon, said printing including at least a color coded product species identifying section,
said system including the subgroups of cartons being grouped together within said groups according to the color coded sections, whereby if a color coded carton is placed in another section the misplacing of that carton can immediately be determined,
a color coded trademark section,
said trademark section including an elongated multi-colored stripe with a distinctive shape extending across the side to at least two edges of said side,
these sections being printed on at least two of said four sides in places to form a uniform pattern extending across said plurality of groups of cartons, when said cartons are placed next to each other regardless of which of said two sides are juxtaposed as said cartons are stacked,
a single color stripe extending on at least a front side of said carton or products as part of said uniform pattern, whereby the gestalt of said cartons create a billboard effect with color coded identification when said cartons are stacked together, and
means in each of said cartons for exposing to view the product enclosed therein.

3,910,413
TRANSPARENT PACKAGE

Joachim Hoppe, Munich, Germany, assignor to G.A.O. Gesellschaft fur Automation und Organization mbH, Germany

Filed Mar. 11, 1974, Ser. No. 450,206
Claims priority, application Austria, Mar. 21, 1973, 2535/73
Int. Cl.[2] B65D *73/00*
U.S. Cl. 206—466 4 Claims

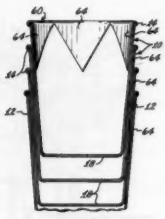


1. In a transparent package for flat articles, such as bank notes, of the type consisting of a transparent bag of plastic material, for receiving the articles, and a relatively stiff card-shape support base having a foldable flap at one narrower end and a coating of heat-sealable plastic on a surface to which the bag is attached, with the bag being attached at one narrower end to the base by folding of the flap over the bag and heat-sealing so that the outer edge of the flap serves as a pull-off edge: the improvement comprising, in combination, slot-like openings formed in said base adjacent the longer edges of said transparent bag for alignment with the outer edge of said folded-down flap and extending inwardly toward the longitudinal center line of said base and toward each other; said openings, during such heat-sealing, exposing the corresponding areas of said bag to weakening by the sealing heat to facilitate pulling-off of said bag along said pull-off edge.

3,910,414
CONTAINER STRUCTURE

Bruce E. McCay, P. O. Box 2123, Lake Havasu City, Ariz. 86403

Filed Oct. 29, 1973, Ser. No. 410,913
Int. Cl.² B65D 21/00
U.S. Cl. 206—515 1 Claim

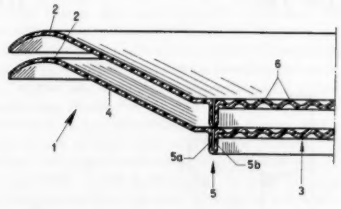


1. A stackable can structure comprising:
a. an elongated body of endless thin wall construction;
b. an openable lid comprising a plurality of radially extending fracturable lines formed in said lid so that a downwardly directed force will rupture said lid into a plurality of segments;
c. said body converging downwardly from said openable lid; and
d. a bottom on said body which is relatively smaller than said openable lid.

3,910,415
THIN-WALLED STACKABLE SHALLOW CONTAINERS SUCH AS DISHES, PLATES AND THE LIKE

Alfons Wilhelm Thiel, Uferstrasse 15, D 6500 Mainz, Germany

Filed Apr. 30, 1973, Ser. No. 355,503
Claims priority, application Germany, Sept. 6, 1972, 7232864; Jan. 11, 1973, 2301215
Int. Cl. B65d 21/02
U.S. Cl. 206—520 10 Claims

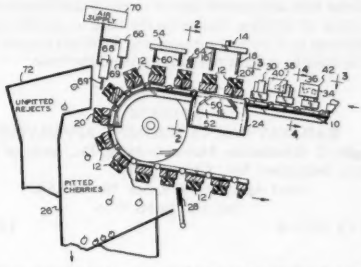


1. A stackable shallow container such as a plate or dish and formed from thermoplastic sheet material of uniform thickness comprising a bottom portion, a side portion extending upwardly and outwardly from said bottom portion and a rim portion extending around the upper edge of said side portion, characterized by a continuous constant height stacking fin extending in a closed outline figure and projecting substantially axially downwardly from one of said portions, said fin consisting essentially of side by side continuous sections of said material in substantially full surface engagement so that the radial spacing therebetween is less than the fin thickness and the fin thickness being substantially twice that of said material whereby when a plurality of said containers are stacked the lower end of the fin of each upper container in the stack cannot enter the upper end of the fin in the next lower container in the stack.

3,910,416
FRUIT PIT DETECTING METHOD AND APPARATUS

George Calvin Payne, Sweet Home, Oreg., assignor to Willamette Cherry Growers, Inc., Salem, Oreg.

Filed Mar. 12, 1974, Ser. No. 450,345
Int. Cl.² B07C 5/342
U.S. Cl. 209—74 M 16 Claims

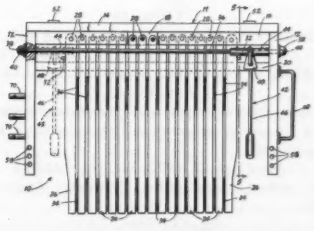


1. An apparatus for inspecting fruit passing through a pitting machine on a conveyor having receptacles for said fruit comprising:
a plurality of detection means for generating signals in response to detecting pits successfully removed from said fruit, said detection means comprising means responsive to passage of said pits after removal thereof from said fruit;
a plurality of circuit means having at least first, intermediate and last storage elements for receiving and storing plural sets of said signals;
timing means responsive to the progress of said receptacles for shifting successive sets of said signals from said first storage elements to subsequent storage elements;
and a plurality of separating means each responsive to the presence or absence of a signal at said last storage element outputs for separating defectively pitted fruit from successfully pitted fruit.

3,910,417
COMPACT CLOTHING HANGING DEVICE

Niel V. Cook, 227 St. Marys Drive, Ballwin, Mo. 63011

Filed Aug. 2, 1974, Ser. No. 494,046
Int. Cl.² A47F 5/08
U.S. Cl. 211—89 10 Claims



10. A garment holder having a base, a plurality of bars on the base and attached to the base to form an array defining a plane, the bars being attached to the base by pins passing through one end of the bars in a direction perpendicular to the plane, the bars being free for limited pivotal movement about the pins in the plane, means biasing the bars in a close parallel relationship, means supporting the bars on the base, means on the bars providing a cushioning and space compensating function between adjacent bars, indexing means on the bars, indexing means on the base cooperating with the indexing means on the bars to locate the spaces between adjacent bars, a slide fixedly mounted on the base at a location above the

plane, opening means mounted on the slide and movable to selected positions above the spaces between adjacent bars, the opening means having a cam means pivotable downwardly about the slide to a position into the spaces between adjacent bars to selectively engage adjacent bars, the opening means having a lever whereby sufficient force may be applied through the cam means to pivot the bars about the pins to open the bars and permit ease of removal and introduction of an article of clothing, means on the base to permit mounting of the base to a vertical surface, and auxilliary support means on the base to at least partially suspend the base.

3,910,418

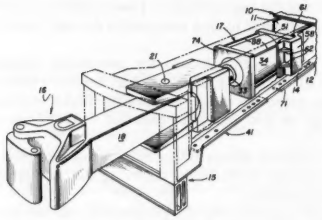
RAILWAY CAR CUSHIONING APPARATUS

Vaughn T. Hawthorne, Mechanicsburg, Pa., assignor to Keystone Industries, Inc., Chicago, Ill.

Filed Apr. 30, 1974, Ser. No. 465,543

Int. Cl.[2] B61G 9/16

U.S. Cl. 213—8 **12 Claims**



1. Cushioning apparatus for use with a railway car including a longitudinally extending center sill, the sill having openings formed in the vertical sides thereof and the openings being generally laterally aligned, said apparatus comprising a housing, a piston rod extending into said housing and adapted to be connected to a coupler of said car, said housing having a pair of lugs formed integrally therewith and extending laterally outwardly from the remainder of said housing, and a member adapted to be positioned in each of said openings and secured to said sill, each of said members having a generally vertically extending slot formed therein, said slots receiving said lugs and thereby holding said housing against longitudinal movement relative to said sill.

3,910,419

DRIVE FOR MOVABLE ELEMENTS SUCH AS RAMS AND TONGS IN A MACHINE FOR MAKING BOTTLES AND SIMILAR CONTAINERS FROM PLASTICIZABLE MATERIAL

Kurt Becker, Obernkirchen, and Hans-Georg Seidel, Rinteln, both of Germany, assignors to Hermann Heye, Obernkirchen, Germany

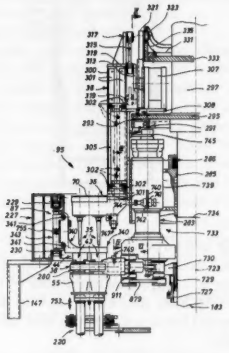
Filed Apr. 7, 1972, Ser. No. 242,054

Claims priority, application Germany, Apr. 14, 1971, 2118132

Int. Cl.[2] B66C 1/62

U.S. Cl. 214—1 BC **18 Claims**

1. In a machine for making bottles or similar containers from plasticizable material, a combination comprising at least one movable element; a cam track extending along a predetermined path; cam follower means movable along said cam track and mechanically connected to said element for moving the latter in a predetermined direction by movement of the cam follower means along said cam track whereby during movement of said element by said cam follower means a load is applied to said cam follower means; moving means for causing movement of said cam follower means along said cam track and thereby moving said element in said predetermined direction; means for lowering the load on said cam follower means during movement thereof by said moving means along said cam track, said means comprising servomotor means also mechanically connected to said element in addition to said moving means for exerting a moving impulse on said element and thereby supporting movement of said element by said cam follower means in said predetermined direction; and means for controlling said servomotor means so that the latter supports movement of said element in said predetermined direction during movement of said element by said cam follower means along said cam track whereby the load applied to said cam follower means is reduced.



3,910,420

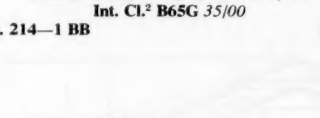
ARTICLE TRANSFER AND SUPPORT APPARATUS

Edward L. Rich, 3980 Peppermill Lane, Bay City, Mich. 48706

Filed June 25, 1973, Ser. No. 372,918

Int. Cl.[2] B65G 35/00

U.S. Cl. 214—1 BB **12 Claims**

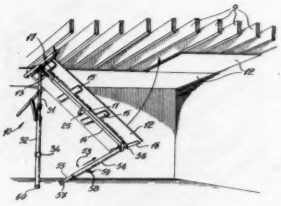


8. Article support and transfer apparatus comprising base means; carriage means for supporting an article; bearing means mounting said carriage means on said base means for movement of said carriage means relatively to said base means along a path; and resiliently compressible means interposed between said bearing means and said carrier means for enabling movement of the latter transversely of said path, said bearing means comprising a housing and wherein said resiliently compressible means comprises a rubbery member carried by said housing.

3,910,421
CEILING BOARD JACK

Jean Panneton, 1085 Crescent Dieppe, Duvernay, Laval, Quebec, Canada

Filed Jan. 7, 1974, Ser. No. 431,307
Int. Cl.[2] E04G *21/16*
U.S. Cl. 214—1 SW **7 Claims**



1. A ceiling board jack for securing boards to frame members of a ceiling, said jack comprising:

a. a hanger shaft and means holding said shaft steady with respect to said ceiling frame members and spaced therefrom, said shaft steadying means comprising:
   1. a first length-adjustable leg made of telescoping upper and lower members and manually operable means to adjust the length of said first leg and to lock it into position,
   2. prongs fixed to and projecting laterally from said shaft to be applied against one of said ceiling frame members, and
   3. means connecting the upper member of said first leg to said hanger shaft for pivotal movement about an axis generally perpendicular thereto and on the side of said shaft across said prongs,
   4. whereby as said manually operable means is actuated to lengthen said first leg and apply said prongs against said ceiling frame member, the position of said hanger shaft with respect to said ceiling frame becomes adjusted through said pivot means connecting said upper leg member and shaft;

b. a board supporting frame having hook-like rigid straps fixed to and projecting from one end of said board supporting frame and unattachedly straddling said shaft whereby to be removably supported thereon;

c. a second length-adjustable leg made of telescoping upper and lower members and means pivoting the upper end of said upper leg member to the other end of said board supporting frame for pivotal movement about an axis transverse to said board supporting frame; and

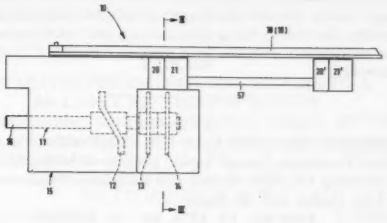
d. stop means at said other end of said frame to prevent a ceiling board thereon from sliding off, whereby in use said hanger shaft is first held steady by said holding means, said straps are hooked over said shaft, a board is placed on said frame which is then lifted close to said ceiling by straightening said pivoting leg with said straps and shaft acting as a hinge.

3,910,422
FEEDING ARRANGEMENT FOR TRANSPORTING MATERIAL AND WORKPIECES

Gunter Zierpka, Karlsruhe, Germany, assignor to Gesellschaft fur Pressen-Automation mbH, Karlsruhe, Germany

Filed Sept. 4, 1974, Ser. No. 502,952
Claims priority, application Germany, Sept. 29, 1973, 2349126
Int. Cl.[2] B65G *61/00*
U.S. Cl. 214—1 BB **10 Claims**

1. A feeding arrangement for step-wise transporting of material or workpieces comprising, in combination, a pair of gripper bars moveable back and forth in the feeding direction; said gripper bars extending along the transport path; means for moving said gripper bars separate from one another in the vertical direction and transversely to the feeding direction; cam drive means having three cams on a common shaft, each of said cams generating the gripper bar motions in one predetermined direction of motion; a base frame; a lifting frame

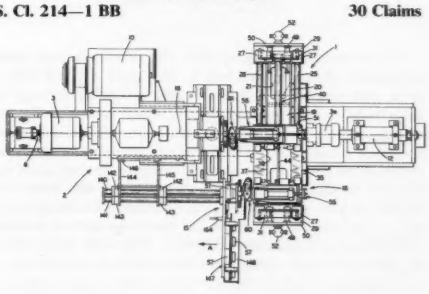


vertically movable in said base frame; cam follower means carried by said lifting frame and operating with one of said cams for generating vertical motion, said lifting frame having longitudinal guide means and transverse guide means for guiding said gripper bars in longitudinal and transverse directions.

3,910,423
SPINNER LOADER EQUIPMENT

Robert J. Killian, North Canton, and Nolte V. Sproul, Canton, both of Ohio, assignors to Aspro, Inc., Canton, Ohio

Filed Oct. 10, 1974, Ser. No. 513,858
Int. Cl.[2] B21D *22/14*
U.S. Cl. 214—1 BB **30 Claims**



1. Apparatus for continuously feeding cup-shaped metal blanks from a supply of such blanks at a pickup station to a location between the headstock and tailstock die assemblies of a spinner, and for removing finished spun V-grooved pulleys from the spinner and depositing the spun pulleys at a discharge station including, carriage support means mounted on a spinner extending transversely with respect to the longitudinal axis of the spinner; carriage means movably mounted on the support means for reciprocating movement along said support means transversely to said longitudinal spinner axis between a pickup station and a discharge station; load and unload slide assemblies movably mounted on the carriage means for relative independent reciprocating movement on the carriage means in directions parallel to said longitudinal spinner axis; gripper means mounted on each slide assembly each movable with respect to the slide assemblies and carriage means; conveyor means for delivering cup-shaped metal blanks to the pickup station; the load slide assembly gripper means being operative to grip and remove a metal blank at the pickup station from said conveyor means and to place the blank between spinner headstock and tailstock die assemblies by the combined relative movement of the load gripper means, the longitudinal movement of the load slide assembly,

and the transverse movement of the carriage means; and the unload slide assembly gripper means being operative to grip and remove a spun pulley from between the spinner headstock and tailstock die assemblies and to deposit said pulley at the discharge station by the combined relative movement of the unload gripper means, the longitudinal movement of the unload slide assembly, and the transverse movement of the carriage means; the unload gripper means and unload slide assembly movements being simultaneous and coordinated with the movements with the load gripper means and load slide assembly.

3,910,424

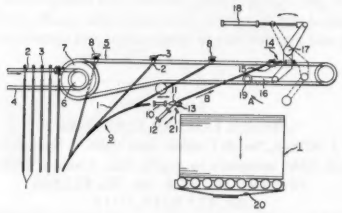
METHOD AND APPARATUS FOR ARRANGING OBJECTS

Kansi Kawahara, Osaka, Japan, assignor to Mitsui Mining & Smelting Co., Ltd., Tokyo and Kawahara Seisakusho Co., Ltd., Osaka, both of, Japan

Filed Feb. 15, 1974, Ser. No. 442,899

Int. Cl.[2] B65G *57/14*

U.S. Cl. 214—6 DK **8 Claims**



1. A method of arranging sheet-like objects having annular suspension elements attached to the upper ends of said objects, and support beams removably extending through said suspension elements of said objects, which comprises the steps of: supporting said beams in spaced-apart relation on movable conveyor means so that said objects are suspended by said beams in an upright, downwardly hanging, spaced-apart relationship on said conveyor means; conveying said beams having said objects suspended thereon toward a discharge station and, as said objects approach said discharge station, gradually raising the lower ends of said objects while said beams remain supported on said conveying means so that said objects become inclined with respect to the vertical; stopping said conveying means when an object reaches said discharge station, while maintaining the object thereat in said inclined position; moving supporting means into supporting engagement with said object at said discharge station to support same thereat independently of said beam; removing said beam from said suspension elements while said object is supported by said supporting means; and then removing said supporting means and permitting said object to drop downwardly in a substantially horizontal orientation so that the objects are stacked in succession one on top of another.

3,910,425

AUTOMATIC PLATE PILING APPARATUS

Masamichi Mahara, Yokohama; Shoichi Suzuki, Tokyo, and Yasuji Yanagida, Yokohama, all of Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1974, Ser. No. 499,922

Int. Cl.[2] B65H *29/10;* **B65G** *57/03*

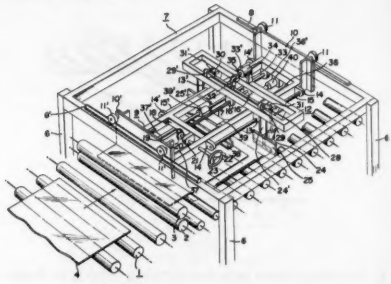
U.S. Cl. 214—6 DK **6 Claims**

1. An automatic plate piling apparatus comprising:

a feeding conveyor for sequentially conveying and feeding a plurality of plates;

a holder normally positioned at a plate receiving station for holding one edge of said plates fed from said feeding conveyor, the other edge of said plates being held by driving rollers of said feeding conveyor;

said holder being reciprocally movable by said plate to a plate discharge station so as to transfer said plates which are suspended between said holder and said driving rollers of said feeding conveyor during said movement, to a piling conveyor; and



a stopper for stopping the movement of said plates during continued movement of said holder,

whereby said plates are released from said holder so as to fall upon said piling conveyor,

the position at which said stopper is located relative to the movement path of said plates being adjustable so as to accommodate various sized plates.

3,910,426

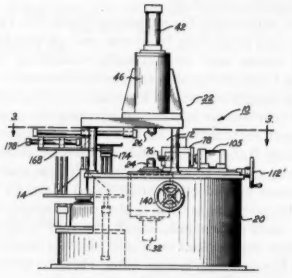
LOADING AND UNLOADING APPARATUS FOR SHEAVE FABRICATING MACHINE

John R. Wagner, Muncie, Ind., assignor to Arrowhead Engineering Corporation, Knox, Ind.

Filed July 12, 1973, Ser. No. 378,646

Int. Cl. B65g *59/04*

U.S. Cl. 214—8.5 D **6 Claims**

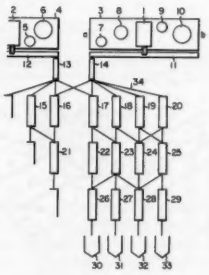


1. A loading apparatus for use with a sheave fabricating machine having a spindle mechanism for holding a disc shaped blank between two relatively movable parts: comprising a turret means rotatable on a vertical axis, a plurality of stations for holding stacks of disc shaped blanks on said turret means, an indexing means for placing one of said stations containing a stack of blanks to a position to be fed into the spindle mechanism, a blank feeder mechanism having an arm and a head on said arm movable between said one station and said spindle mechanism, a means on said head for carrying a blank from said one station to said spindle mechanism, and a means on said head for withdrawing a sheave from the spindle mechanism, including a tray, a pivot means for said tray, and a means for pivoting said tray to one side to discharge the completed sheaves.

3,910,427
CONVEYANCE CONTROL APPARATUS AND METHOD

Kotaro Hirasawa; Nobuhiro Hamada; Yukio Kawamoto, all of Hitachi; Hikaru Nakayama, Tokyo, and Shimbu Yamagata, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 31, 1973, Ser. No. 384,226
Claims priority, application Japan, Aug. 1, 1972, 47-76442
Int. Cl. B65g 65/30
U.S. Cl. 214—16 R 9 Claims

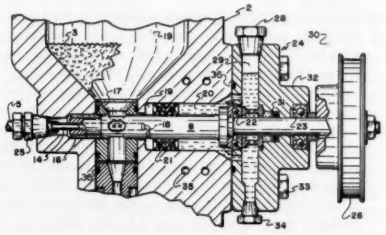


7. A conveyor control system for conveying articles along routes to storehouses having constant delivery rate, comprising means for memorizing a conveying plan; means for forming sequence restriction to conveying operations stored in the conveying plan memory means; means for forming a valuation function from conveying operation starting times and conveying time periods of the conveying operations stored in the conveying plan memory means; and means for modifying the conveying operation starting times and the conveying time periods of the conveying operations such that the valuation function is optimized under the sequence restrictions provided.

3,910,428
COAL TO REACTOR FEEDER FOR COAL LIQUIDIFICATION

William Donald Peterson, II, 1996 E. 4675 South, Salt Lake City, Utah 84117

Filed Nov. 15, 1973, Ser. No. 416,210
Int. Cl.² B65G 65/32
U.S. Cl. 214—17 CC 4 Claims

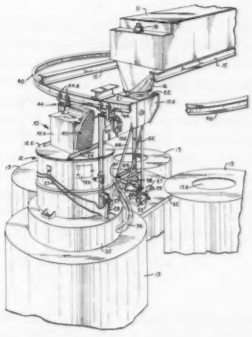


1. Apparatus for feeding granular material from a hopper to a second vessel while maintaining a seal there between, comprising an outlet opening in the hopper bottom, a hollow shaft mounted transverse of said opening closing the same and rotatable therein, a plurality of buckets formed in the surface of said shaft and arranged to register successively with the interior of said hopper upon rotation of said shaft, a tube received axially in the interior of said hollow shaft, means fixing said tube against rotation, means for rotating said shaft about said tube, a port in the bottom of each of said buckets, a first port in the side wall of said tube positioned to register with said port in the bottom of successive ones of said buckets as they rotate about said tube to a discharge position, means for supplying pressured fluid to said tube to exit from said port, at least two additional ports in said tube located one on each side of the path of travel of said buckets, and means sealing said shaft on both sides of said buckets so that pressured fluid supplied to said tube flows from said additional ports toward said outlet opening of said hopper.

3,910,429
APPARATUS FOR DISTRIBUTING HOTMIX TO A MULTIPLE BIN STORAGE SYSTEM

D. Bruce Zumsteg, Raytown; J. T. Odom, Glasgow, and William L. Walkington, Fayette, all of Mo., assignors to Standard Havens, Inc., Kansas City, Mo.

Filed May 28, 1974, Ser. No. 473,510
Int. Cl.² B65G 3/18, 3/20
U.S. Cl. 214—16 R 4 Claims



1. Apparatus for distributing material from material delivery equipment to a plurality of storage bins, said apparatus comprising:

a conveyor having an inlet end supportingly and pivotally connected to said material delivery equipment and an outlet end remote from said material delivery equipment, said conveyor operable to transport material received from said material delivery equipment at said inlet end to said outlet end for discharge therefrom, and adapted to pivot about a vertical pivot axis at said inlet end, said pivot axis being equidistant from each of said storage bins;

a bin feeder elevated with respect to said bins and connected to said conveyor to receive material from the outlet end thereof and having a discharge opening through which material is discharged to said bins, said feeder including power operated movable closure means associated with said discharge opening to hold material within said feeder and to intermittently dispense material to said bins;

an overhead track member, arcuate about a point coincident with said vertical pivot axis, supporting from above said bin feeder and said outer end of the conveyor;

power means adapted to rotatably move said conveyor and bin feeder upon said track member about said vertical pivot axis and to selectively and indexingly position said feeder above each of said bins for the discharge of material thereto;

a chamber housing connected to said bin feeder to shroud said discharge opening and having a material passage

disposed closely adjacent said bin when said feeder is indexingly positioned thereabove to permit delivery of material from said feeder to said bin; and

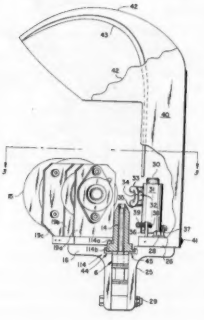
an evacuation system including ductwork connected to said chamber housing and equipped with a rotatable fitting to permit pivotal movement of said ductwork keyed to movement of said feeder and conveyor, and vacuum means connected to said ductwork to draw pollutants emitted during discharge of material from said feeder to said bin through said chamber housing and said ductwork.

3,910,430

PARISON UNLOADER

Nickolas N. Sokolow, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Mar. 29, 1974, Ser. No. 456,299
Int. Cl.[2] B65G *47/34*
U.S. Cl. 214—21 **27 Claims**



1. A device for removing a parison from a carrying means comprising:

first engaging means for engaging a first peripheral portion of a parison,

second engaging means for engaging a second peripheral portion of said parison,

said second peripheral portion being at any location peripherally opposed to said first peripheral portion,

said second engaging means being driven independently of said parison to engage said parison to impart axial motion to said parison in a direction away from said carrying means,

resilient means for urging the first engaging means towards the carrying means and permitting resilient movement of the first means away therefrom,

said first and second means comprising elongated members generally extending in the direction of travel of the carrying means and converging towards each other in said direction of travel to form a nip which the parison enters.

25. In a method of removing a tubular parison from a position surrounding a pin of a pin type conveying means, said conveying means going through a heating oven, comprising the steps of:

engaging and resiliently urging the parison on one side thereof in a manner tending to move the parison laterally, and

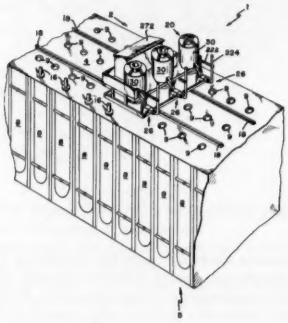
simultaneously, from the other side of the parison, imparting an axial motion to the parison in a direction away from the conveying means to strip the parison from said pin.

3,910,431

AUTOMATIC COAL CHARGING CAR

Homer Donald Fuller, and James Arthur Little, both of Ashland, Ky., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 4, 1974, Ser. No. 430,987
Int. Cl.[2] C10B *31/04*
U.S. Cl. 214—35 R **26 Claims**



1. A coal charging car adapted for conveying coal to a coke oven having a lid on a charging hole, said charging hole having heat emanating therefrom when the coke oven is in operation, said coal charging car in combination comprising:

a coal hopper assembly which receives coal from a coal supply source;

a turntable assembly disposed below said coal hopper assembly, said turntable assembly being adapted to cooperate in dispensing coal from said coal hopper assembly;

means for displacing said turntable assembly and said coal hopper assembly from said charging hole when coal is being charged into said charging hole, thereby avoiding exposure of said turntable assembly to the heat from said charging hole;

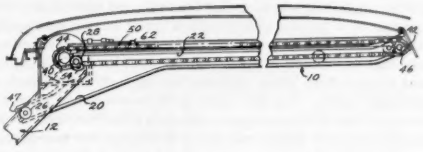
a lid lifter assembly disposed adjacent to said coal hopper assembly, said lid lifter assembly being adapted to remove said lid from said charging hole of said coke oven, prior to the charging of coal into said charging hole;

a coal drop assembly connected to and disposed below said coal hopper assembly, said coal drop assembly being adapted to deliver coal from said coal hopper assembly to said charging hole of said coke oven, said displacing means comprising: an inclined coal section of said coal drop assembly, the longitudinal axis of which is inclined at an angle with reference to the horizontal plane, said inclined coal section having a length which exceeds the maximum width within said coal drop assembly and being connected to said coal hopper assembly, said inclined coal section being adapted to receive coal from said coal hopper assembly, and said length of said inclined section substantially displacing said coal hopper assembly and said turntable assembly from and out of vertical alignment with the charging hole during the charging of coal into the charging hole, thereby avoiding exposure of said coal hopper assembly and said turntable assembly to the heat from said charging hole, said substantial displacement resulting from said length of said inclined coal section.

3,910,432
APPARATUS FOR LIFTING AND LOADING A LOAD INTO AND OUT OF A VEHICLE OR THE LIKE

Kenneth A. Browne, Lexington, and Ronald O. Browne, Staunton, both of Va., assignors to Browne Engineering Corporation, Staunton, Va.

Filed Sept. 10, 1973, Ser. No. 395,602
Int. Cl.[2] B65D *9/00*
U.S. Cl. 214—75 H 9 Claims

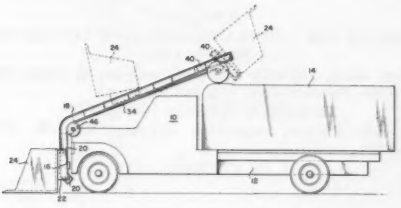


1. An apparatus which can be installed or included in a motor vehicle so as to provide for means for lifting and lowering a load into and out of the vehicle through an opening through a side or end wall thereof, said apparatus comprising:
a support member which can be installed in an overhead position within the vehicle so as to extend from a position proximate to an opening formed through a wall of the vehicle to a position located over an interior floor area of the vehicle,
an elongated boom assembly carried by said support member so as to be movable back and forth along the length of said support member, said boom assembly having means for suspending a load from one end thereof, said load carrying end being spaced from said support member,
guide track means carried by said support member for guiding back and forth movements of said boom assembly relative to said support member and for defining a path of travel for a load carrying end of said boom assembly which includes (a) a generally horizontal path of travel for traversing a load over a floor area of said vehicle, (b) a first inclined path of travel which extends from an end of said horizontal path of travel nearest the opening through which the load is to be moved to a position outside of the vehicle which is lower than said horizontal path, so that a load can be received or deposited at an outside area and at a level lower than the floor level of the vehicle and (c) a second inclined path of travel extending from an opposite end of said horizontal path of travel to a position which provides for a lowering and lifting of a load to and from the floor area of the vehicle relative to said horizontal path,
said guide track means including a generally upwardly facing guiding surface and a generally downwardly facing guiding surface, said downwardly facing guiding surface being vertically spaced from and above said upwardly facing guiding surface and said guiding surface extending along the length of the guide track means to define said paths of travel, including said upwardly facing guiding surface defining a path of travel which includes said generally horizontal path and said first inclined path and said downwardly facing guiding surface defining a path of travel which includes said generally horizontal path and said second inclined path, for said boom assembly,
first and second follower elements carried by said boom assembly and spaced along the length of said boom assembly, said first follower element being closer to said load carrying end of said boom assembly than said second follower element,
said first follower element being biased into engagement with said generally upwardly facing guiding surface and said second follower element being biased into engagement with said generally downwardly facing guiding surface and said follower elements lying in generally the same horizontal plane when being guided in said generally horizontal path of travel, and
driving means for moving said boom assembly back and forth along said guide track means.

3,910,433
VEHICLE HAVING FRONT END LOADER

Richard R. Love, P. O. Box 468, Buhl, Idaho 83316

Filed July 26, 1974, Ser. No. 492,226
Int. Cl.[2] B60P *1/44*
U.S. Cl. 214—75 R 8 Claims

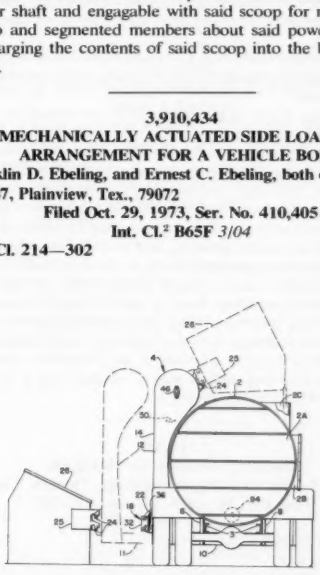


1. In a vehicle front end loading device comprising a vehicle having an open top body, a pair of track members mounted on the forward end of said vehicle and extending over a portion of said body, a scoop mounted on said track members for movement therealong, a power shaft carried by said track members, means for rotatably driving said shaft, segmented members carried by said power shaft for movement thereabout, said segmented members being aligned with said track members to receive said scoop and means carried by said power shaft and engagable with said scoop for moving said scoop and segmented members about said power shaft for discharging the contents of said scoop into the body of the truck.

3,910,434
MECHANICALLY ACTUATED SIDE LOADING ARRANGEMENT FOR A VEHICLE BODY

Franklin D. Ebeling, and Ernest C. Ebeling, both of P.O. Box 1747, Plainview, Tex., 79072

Filed Oct. 29, 1973, Ser. No. 410,405
Int. Cl.[2] B65F *3/04*
U.S. Cl. 214—302 23 Claims



22. In combination with a vehicle having power supply means and a hollow body having an elevated access opening, apparatus for emptying the contents of a container into said hollow body of the vehicle through said elevated access opening, comprising:
a. elevator means on said vehicle to raise and lower said container, said elevator means including means defining an upstanding guide track having an upper end adjacent said elevated access opening and a lower end adjacent a surface supporting the container and container holding means movable along said guide track,

b. means connecting said elevator means to said power supply means to move at least said lower end of said guide track over said surface between a first position closely adjacent said vehicle and a second position spaced outwardly from said vehicle and closely adjacent said container, and

c. container engaging means on said container holding means to mechanically engage said container when said lower end of said guide track is moved to said second position by said power supply means.

3,910,435

VEHICLE FOR THE TRANSPORTING OF CONTAINERS AND THE LIKE

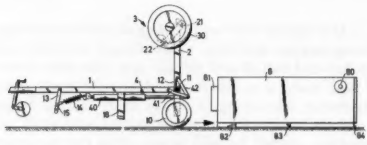
Albert Haag, Mitteltal, Germany, assignor to Firma Karl Muller, Fahrzeugwerk, Mitteltal, Germany

Filed Dec. 5, 1973, Ser. No. 422,074

Claims priority, application Germany, Dec. 8, 1972, 2260224

Int. Cl.² B60P *3/00*

U.S. Cl. 214—390 **16 Claims**



1. A vehicle for the transportation of a container, such as a garbage container, transportation container or a cable drum, comprising:

a substantially horizontal U-shaped frame open towards its rear constituting means for receiving and depositing said container,

an auxiliary frame of U-configuration connected by a pivot to said U-shaped frame at the open ends of the respective U's, an undercarriage having wheels which connects the legs of the auxiliary frame thereby forming the closed end thereof, said undercarriage further being swingable over the top of, around the rear of, and below said container when said container is engaged by said U-shaped frame in the transportation position, said pivot having a horizontal axis extending perpendicularly to the longitudinal axis of said vehicle, said U-shaped frame being provided with supporting members fixed to said U-shaped frame, said supporting members being lifted from the ground when said undercarriage is swung below said container, and in the upward swung position of said auxiliary frame the region disposed within said U-shaped frame is freely accessible from the rear.

3,910,436

HEAVY IMPLEMENT TRAILER

Frank P. Machan, Box 157, Wallaceburg, Ontario, Canada

Filed Oct. 10, 1974, Ser. No. 513,583

Int. Cl.² B60P *1/04*

U.S. Cl. 214—506 **3 Claims**

1. A trailer for transporting heavy implements and materials, comprising in combination a platform consisting of an elongated, rectangular framework of two parallel pipes or tubing spaced and held together by angle iron cross pieces upon which are located a number of heavy wooden planks running parallel to and between the said pipes, each of said pipes provided at its rear end with a small but heavy wheel slightly larger in diameter than the diameter of said pipe, and said pipes converging at their ends to form a triangle, a hitch mounted at the vertex of said triangle for attachment to a tractor; and a jack equipped with a wheel at the bottom thereof, located behind the hitch for raising and lowering the front end of said platform; a carriage supporting said platform and upon which the said platform can slide backward or forward comprising an upper section consisting of two parallel spaced angle iron tracks toeing inwardly and spaced and held together by a tubular cross piece; a lower section comprising two spaced axle bars of rectangular cross-section to which are attached the wheels of the trailer; a shaft located within the said tubular cross piece and attached at each end to each of said axle bars so that the upper section can swivel upon the lower section of the carriage; a plurality of rubber tired wheels attached to each of said axle bars; a horizontal bar stop at each rear end of said platform pipes, and a vertical bar stop at the front ends of each of said angle iron tracks, said stops engaging each other to prevent the separation of the platform and carriage; means for locking the platform to the carriage to prevent platform sliding; and means for locking the carriage wheels against rotation.

3,910,437

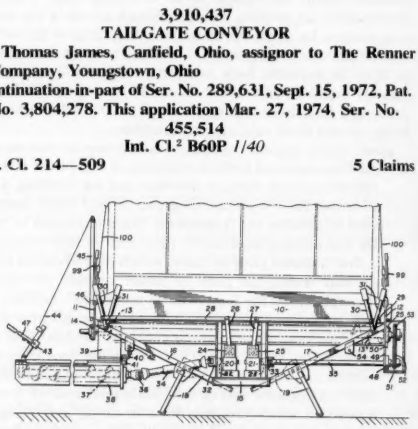
TAILGATE CONVEYOR

W. Thomas James, Canfield, Ohio, assignor to The Renner Company, Youngstown, Ohio

Continuation-in-part of Ser. No. 289,631, Sept. 15, 1972, Pat. No. 3,804,278. This application Mar. 27, 1974, Ser. No. 455,514

Int. Cl.² B60P *1/40*

U.S. Cl. 214—509 **5 Claims**



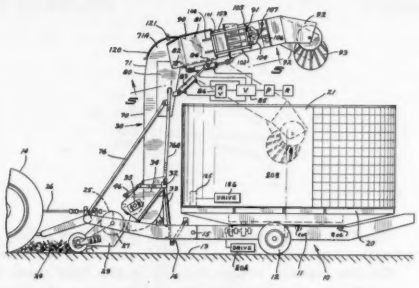
1. A tailgate conveyor for attachment to a dump truck and consisting of a framework, a first open topped housing on said framework with an elongated screw therein arranged for delivery of material at either end, an extension conveyor consisting of a secondary open topped housing having a secondary elongated screw therein, means for removably attaching said secondary open topped housing to said framework at either end thereof and partially below one end of said first housing so as to permit relocation of said extension conveyor to either end of said framework, means for adjustably supporting said extension conveyor relative to said first open topped housing, means for driving said conveyors including a pair of hydraulic motors, drive shafts removably connecting said screws and said hydraulic motors, means establishing communication between said hydraulic motors and a remote soure of fluid pressure, valves in said communication means arranged to control said hydraulic motors and levers on said valves for actuating the same and means on said tailgate conveyor for engaging said dump truck and aligning said first open topped housing therewith, said means for engaging said dump truck including members movable longitudinally of said first open topped housing, arms on said members at right angles thereto and means on said arms for engaging the opposite sides of said dump truck.

3,910,438

MOBILE HAY STACKER CONVEYOR CONSTRUCTION

Joseph A. Anderson; Ruben D. Morlock, and Chester G. Neukom, all of Jamestown, N. Dak., assignors to Haybuster Manufacturing, Inc., Jamestown, N. Dak.

Continuation-in-part of Ser. No. 252,426, May 11, 1972. This application Nov. 15, 1973, Ser. No. 416,072
Int. Cl. B60p 1/60
U.S. Cl. 214—518 9 Claims



6. A forage crop stacking machine for crop material such as hay, including a frame, a stack forming bed mounted for movement relative to said frame, means for delivering crop material to said bed comprising feeding means including a chute member forming a conveyor tube mounted on said frame, said conveyor tube including an uprightly extending section having a lower end and an upper end, and a laterally extending section having an outer end portion forming a discharge opening, first means mounting said laterally extending section to said uprightly extending section adjacent the upper end of the uprightly extending section about a first substantially horizontal axis and second means movable about said first axis and positioned adjacent one side of said laterally extending section mounting said laterally extending section for movement about a separate generally upright axis, power means to move said laterally extending section about said upright axis, feeder means adjacent the lower end of said tube to feed crop material into said conveyor tube and to push crop material along said conveyor tube in direction toward said discharge opening, said conveyor tube including means forming at least one shoulder adjacent the feeder means and facing in direction toward the discharge opening with reference to the direction of movement of forage crop material, said shoulder expanding the conveyor tube abruptly without first causing a constriction in said conveyor tube, a rotating packing member rotatably mounted at an outer end of said laterally extending section in position to engage crop material discharged through said discharge opening and carried on said bed, said rotating packing member being movable with the outer end of said laterally extending section about said upright axis, and means to permit exerting a force yieldingly resisting upward movement of said laterally extending section and said packing member about said first axis.

3,910,439

MOBILE PLATFORM STRUCTURE FOR FRUIT PICKERS

John M. Ross, Upland, and Ronald T. Smith, Ontario, both of Calif., assignors to Sunkist Growers, Inc., Sherman Oaks, Calif.

Division of Ser. No. 31,924, April 27, 1970, Pat. No. 3,690,092. This application Dec. 21, 1971, Ser. No. 210,520
Int. Cl.[2] B60P 1/36, 1/64
U.S. Cl. 214—520 33 Claims

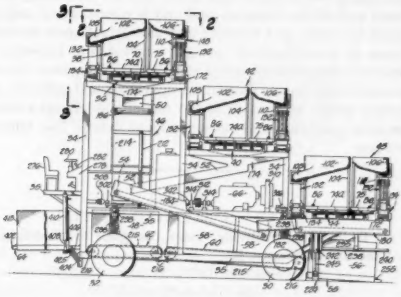
1. In an apparatus of the character described to facilitate picking fruit from trees, the combination of:

a vehicle having ground wheels;

a plurality of platforms at different levels on the vehicle to support fruit-picking workmen;

hoppers mounted on the various platforms to receive the picked fruit,

each hopper being at a height relative to the corresponding platform that is intermediate the height of a workman on



the platform and having an inner wall to permit the workman to lean against the hopper,

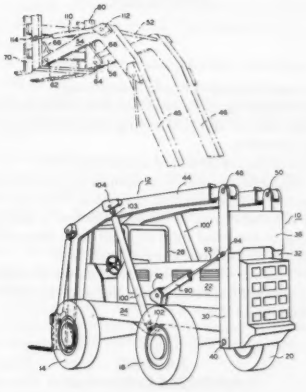
said inner wall of each hopper being resiliently flexible to yield to the leaning workman by bowing outwardly over the hopper to conform to the configuration of the leaning workman's body.

3,910,440

VERTICAL LIFT, EXTENDIBLE REACH MECHANISM FOR A TRUCK

Donald A. Holtkamp, and Willard L. Chichester, both of Battle Creek, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed July 11, 1973, Ser. No. 378,160
Int. Cl.[2] E02F 3/85
U.S. Cl. 214—770 6 Claims



1. A vertical lift, extendible reach mechanism for a truck having a forward end and a rearward end, comprising a post pivotally connected at its lower end to the rear of the truck, a boom pivotally connected to the upper end of said post and extending forwardly therefrom, said boom having telescopic sections for varying the effective length thereof, a load carry-

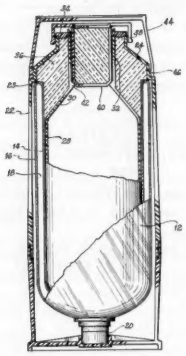
ing attachment connected to the forward end of said boom, a power means connected to said post for pivoting said post forwardly and rearwardly to move said boom and load attachment forwardly and rearwardly, a power means for lifting and lowering the forward end of the boom while pivoting on said post, a hydraulic cylinder moving said telescopic sections relative to one anotehr for retracting the forward end of the boom as said end is raised to a point substantially level with the rear pivot point of said boom and for extending the forward end of the boom as said end is raised above said pivot point to cause said forward end and attachment thereon to move in a substantially straight vertical line between their lowered and raised positions, a hydraulic system having a control valve means therein for operating said cylinder, and a switch means responsive to the movement of said telescopic sections actuating said valve means to extend said telescopic section.

3,910,441

VACUUM INSULATED BOTTLE

Carl Bramming, Nashville, Tenn., assignor to Aladdin Industries, Inc., Chicago, Ill.

Filed Feb. 28, 1974, Ser. No. 446,695
Int. Cl.² A47J *41/02*
U.S. Cl. 215—13 R **11 Claims**



1. A vacuum insulated bottle comprising:
a vacuum filler having a heat insulating interior for receiving material therein and having a relatively wide opening to said interior;
a protective jacket disposed about said filler;
a liner adjacent to closely conforming to disposed in the temperature insulating interior of said filler and extending upwardly therefrom to form a relatively narrow mouth opening to the lined interior, said liner being attached to the jacket at the liner's upper end; and
a collar formed of heat insulating material disposed in a cavity formed between the jacket and the liner near said wide opening.

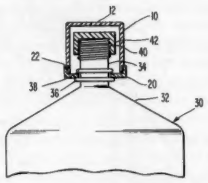
3,910,442

BOTTLE SAFETY CAP

Richard Joseph Gargano, 232 Cedar St., South Bound Brook, N.J. 08880

Filed July 8, 1974, Ser. No. 486,679
Int. Cl.² B65D *55/02*
U.S. Cl. 215—218 **4 Claims**

1. A safety cap for a bottle having a neck and a top at the end of the neck comprising
an annular base with a center opening slightly larger than the neck of the bottle,
base retaining means mounted on the neck of the bottle to prevent removal of the base after installation of the neck, a cap completely covering the top and a portion of the neck of the bottle, and
locking means joining the cap and the base comprising a peripheral flange located around the annular surface of the base, a plurality of inwardly directed radial lugs lo-



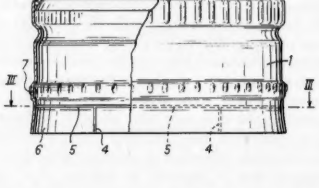
cated on the peripheral flange, a plurality of axially directed lugs located on the annular surface of the base, a flexible annular washer located in the base upon the axially directed lugs and the cap having a plurality of shaped embossments located around the outside bottom surface whereby upon pressing the cap downwardly into the base, the washer flexes allowing the radial lugs of the base to pass along the shaped surfaces of the embossments into a locked position.

3,910,443

CLOSURES

William Henry Hadley, Lichfield, England, assignor to Metal Closures Limited, West Bromwich, England

Filed Apr. 3, 1973, Ser. No. 347,474
Claims priority, application United Kingdom, Apr. 5, 1972, 15740/72
Int. Cl.² B65D *41/34*
U.S. Cl. 215—252 **3 Claims**



1. A closure blank of the pilferproof type in which the upper part of the closure skirt is adapted to be engaged with the thread on a bottle neck by a thread rolling operation and having a security band at the lower margin of the skirt which is adapted to be engaged under an abutment ring on the bottle neck wherein the improvement comprises providing a continuous peripheral score line at the junction between the security band and the upper part of the skirt and also dividing the security band into a plurality of separate sections by generally vertical lines of weakness whereby, when said blank has been positioned on a bottle neck with its closure skirt engaged with the thread on a bottle neck and with its security band engaged under the abutment ring on said neck, unscrewing said closure from said bottle and the resulting interaction between said abutment ring and the portion of said security ring which has been engaged thereunder will cause said lines of weakness to burst open, the lower portions of said sections to flare noticeably outward, and the continuity between said sections with said upper part of said skirt to be interrupted only at each end of each section by their being torn apart from said skirt along

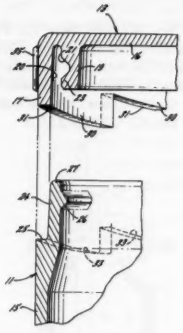
said score line so as to present a tangential connection between the segment and the skirt.

3,910,444

CONTAINER HAVING SNAP-ON, TWIST-OFF CAP

John A. Foster, Rockford, Ill., assignor to J. L. Clark Manufacturing Co., Rockford, Ill.

Filed June 6, 1974, Ser. No. 476,937
Int. Cl.[2] B65B *43/38, 43/40;* **B65D** *17/00, 39/00*
U.S. Cl. 215—295 **6 Claims**



1. A container comprising a cup-shaped body and a cup-shaped top cover each made of resiliently yieldable material and each having an axially extending circular wall, said body having a substantially greater depth than said cover, a circular skirt formed integrally with and depending from the top of said cover, said skirt being spaced radially inwardly from and extending around the wall of said cover and coacting with such wall to define a downwardly opening annular groove, a circular neck of reduced diameter formed integrally with and projecting upwardly from the free edge of the wall of said body and telescoped into said groove, a circumferential groove extending around the outer side of said skirt, a series of angularly spaced nibs formed integrally with and projecting inwardly from the inner side of said neck and adapted to snap into and interlock with said circumferential groove as said neck is telescoped into said annular groove, said nibs and said circumferential groove coacting to restrict axial removal of said cover from said body, and first and second sets of angularly spaced teeth formed in and extending circumferentially around the free edges of the walls of said cover and said body, respectively, each set of teeth defining a continuous circular saw tooth, the teeth of each set normally mating with the teeth of the other set but camming against the teeth of the other set during relative rotation of said body and said cover and being operable as an incident to such camming to shift said cover axially away from said body and release said nibs from said circumferential groove so as to permit removal of said cover from said body.

3,910,445

CONTAINER CLOSURE

Roberto Gavazos Garza, and John R. Martin, both of Monterrey, N.L., Mexico, assignors to Vidriera Monterrey, S.A., Monterrey, N. L., Mexico

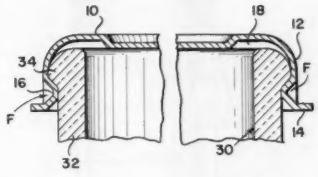
Filed May 31, 1974, Ser. No. 475,120
Int. Cl.[2] B65D *41/10, 41/12, 41/40*
U.S. Cl. 215—328 **1 Claim**

1. A closure cap for open top glass or plastic containers of thin wall construction having at least an upper cylindrical portion with a radially outwardly extending bead adjacent the open end of the container, said closure being of plastically deformable material and comprising:

a substantially plain circular portion of a diameter to sealingly engage the open top of the container;

a cylindrical skirt portion depending from said circular portion;

a flat rim extending radially outwardly from that end of said skirt portion remote from said first portion and at substantially 90° to said skirt portion;



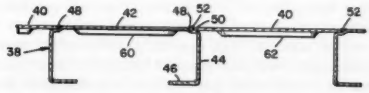
said skirt portion having a series of corrugations therein adjacent said rim, said closure being applied to a container by radial compression applied to the junction of said rim and said skirt to increase the thickness of metal in said rim and reduce the inside diameter of said rim by an amount to prevent removal from the container without stretching said rim in hoop tension beyond its yield point to permit free removal over the bead of the container.

3,910,446

FLOOR STRUCTURE FOR CARGO CONTAINER

Robert S. Dougherty, Upper Ames Ave., Ross, Calif. 94957

Filed Dec. 3, 1973, Ser. No. 420,800
Int. Cl.[2] B65D *87/00, 7/42*
U.S. Cl. 220—1.5 **6 Claims**



1. In a portable cargo carrying container for use in storing and transporting freight, a metal floor structure for said container comprising,

a rigid rectangular metal frame member including side and end rails,

a plurality of elongated relatively stiff metal cross-members laterally spaced apart at intervals along the length of said side rails,

said cross-members each provided with a web portion having its marginal side edge portions depressed below its top level by a predetermined amount,

a wall depending from each depressed side edge of the web portion,

a plurality of elongated metal plate members, each located between a pair of adjacent spaced apart cross-members and welded at its side edges to the depressed marginal edge portions of the web portions, the thickness of said plate members being substantially equal to the amount by which the marginal side edge portion of a web portion is depressed,

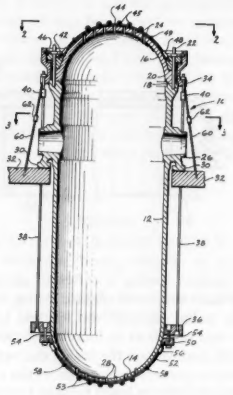
said side rails each including a vertical wall,

the end edges of said plate members of said web members and of the depending walls of the web portion abutting the vertical wall and being welded thereto, to secure said plate members, cross-members and side rails together into a unitary self-contained structure free of external fastening devices and/or overlapping portions of materials.

3,910,447
VESSEL RESTRAINT DEVICE

Frank Bevilacqua, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 1, 1974, Ser. No. 447,187
Int. Cl. F17c *17/12*
U.S. Cl. 220—3 **5 Claims**

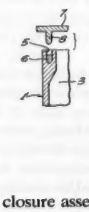


1. In combination, a pressure vessel having a main cylindrical portion, a first hemispherical portion integral with and closing one end of the cylindrical portion, a removable second hemispherical portion closing the other end of the cylindrical portion, bolt means for securing the second hemispherical portion to the cylindrical portion, vessel restraint means for preventing the vessel from breaking apart upon rupture thereof, said vessel restraint means including first collar means encircling and engaging the vessel adjacent its first end, second collar means encircling and engaging the vessel adjacent its other end, a first set of a plurality of spaced, parallel cables extending between said first and second collar means, a second set of a plurality of spaced, parallel cables extending across the outer surface of the first hemispherical portion, said second set of cables being secured at both of their ends to the first collar means, and a third set of a plurality of spaced, parallel cables extending across the outer surface of the second hemispherical portion, said third set of cables being secured at both of their ends to the second collar means.

3,910,448
HEAT RECOVERABLE CLOSURE ASSEMBLY

Anthony Charles Evans, and Pierre Peautaurit, both of Brussels, Belgium, assignors to N. V. Raychem S.A., Kessel-lo, Belgium

Filed May 31, 1974, Ser. No. 474,951
Claims priority, application United Kingdom, June 6, 1973, 26176/73
Int. Cl.² B65D *43/02*
U.S. Cl. 220—3.8 **11 Claims**



1. A heat recoverable closure assembly comprising:

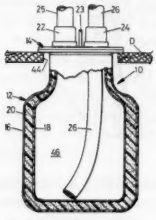
a container, said container including an opening into said container and a groove adjacent said opening, said groove being defined by heat recoverable material; and

a closure member of high thermal conductivity, said closure member including a flange capable of coextensive arrangement with said groove, said flange being wider than said groove when said groove is in its heat stable state.

3,910,449
SANITARY HOLDING SUMP AND METHOD OF MAKING

Walter A. Gezari, Killingworth, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 307,230, Nov. 16, 1972, Pat. No. 3,808,996, which is a division of Ser. No. 122,721, March 10, 1971, Pat. No. 3,722,538, which is a continuation-in-part of Ser. No. 24,789, Aug. 1, 1970, abandoned. This application May 6, 1974, Ser. No. 467,469
Int. Cl.² B65D *25/18*
U.S. Cl. 220—9 F **2 Claims**



1. A sanitary holding sump comprising:

a container with an opening on one side having a laminated construction including an outer envelope, an inner envelope and rigid plastic foam filling the space between the inner and outer envelopes;

said inner and outer envelopes being plastic bags that are flexible prior to lamination with said foam; and

a sump cover positioned in the opening of the container, said cover including inner and outer circular flange elements, said inner flange element being joined to the inner envelope and said outer flange element being joined to the outer envelope.

3,910,450
BUNG DRUM MADE OF PLASTICS WITH ONE OR MORE BUNG OPENINGS

Wilhelm Hammes, Haupstrasse 38, 5302 Much, Germany

Continuation-in-part of Ser. No. 362,316, May 21, 1973. This application Nov. 27, 1973, Ser. No. 419,241
Claims priority, application Germany, Dec. 21, 1972, 2262622
Int. Cl.² B65D *7/42*
U.S. Cl. 220—67 **3 Claims**

1. A drum of the type having a plastic body portion and a separate plastic closure portion firmly seated within an end of the body portion comprising the combination of:

a. a body portion having a mouth portion at one end thereof, said mouth portion having

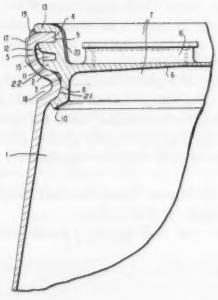
1. an inwardly projecting circumferential bead-like bulge, said bulge defining a generally radially inwardly projecting annular gripping recess,

2. an inwardly bent circumferential lip located outwardly of said bulge relative to a longitudinal axis of the drum, and

3. an intermediate section extending between said bulge and said lip and defining a generally radially outwardly projecting annular first groove; and

b. a plastic end closure for said mouth portion having circumferential margin means firmly anchored within the mouth portion of said body portion to resist distortion of the latter while preventing removal of said end closure from said body portion, said margin means comprising

1. an outwardly-bent circumferential lip at each end,
2. a first circumferential flange forming, with a first of said outwardly bent lips, a first groove engaging and seating the inwardly bent circumferential lip of the mouth portion of the drum, said first circumferential flange and said first outwardly bent lip extending radially outward beyond the radial inner extent of the inwardly bent circumferential lip on the mouth portion of the drum body portion such that said first circumferential flange and said first outwardly bent lip firmly engage substantially all of the area of the opposite longitudinally spaced surfaces on said inwardly bent



circumferential lip, the inwardly bent circumferential lip extending into said first groove the entire depth thereof, and

3. a second circumferential flange forming with the second of said lips a second annular groove engaging and seating the inwardly projecting circumferential bead-like bulge of the drum, said second circumferential flange and said second lip extending radially outward beyond the radial inner extent of said bulge such that said second flange and said second lip firmly engage opposite longitudinally spaced surfaces of said bulge, said engagements forming substantially inseparable joints; and

c. a peripheral bead of material forming a weld joining the peripheral edge of the first of said lips of the closure portion and said inwardly-bent circumferential lip of the mouth portion of the drum.

3,910,451
RADIATOR CAP

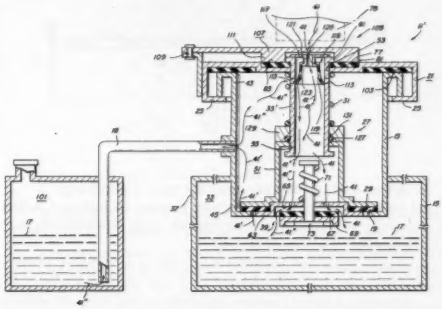
Arthur P. Tusing, P.O. Box 64, Dell, Ark. 72426

Continuation-in-part of Ser. No. 402,196, Oct. 1, 1973, abandoned. This application Jan. 29, 1974, Ser. No. 437,615

Int. Cl.[2] B65D *51/16*

U.S. Cl. 220—203 **6 Claims**

1. In combination with a vented recovery overflow tank and a radiator communicated one with the other through the filler neck of the radiator, of a closure device for closing the filler neck of the radiator and allowing coolant to be admitted to the interior of the radiator while said closure device remains attached to the radiator, said device comprising a cap body provided with an aperture disposed concentrically thereof, said filler neck including primary and secondary seat means coacting with said device for sealing the respective lower and upper ends of said filler neck, pressure plate means disposed adjacent said primary seal means and including spring means for yieldably allowing pressurized coolant to pass from said radiator into said filler neck thence into said recovery overflow tank, outer tubular bypass means disposed within said filler neck and extending from said pressure plate means to said cap body for communicating the interior of said radiator with the exterior thereof, stopper means for selectively closing and opening said outer tubular bypass means, said pressure plate means being provided with an aperture for receiving the lower end of said outer bypass means with the upper end of said outer bypass means extending through said aperture in said cap body, said outer tubular bypass means being provided



with at least one transverse hole opening into said filler neck, upper check valve means selectively occluding said outer tubular bypass means and being disposed therein subjacent said transverse hole for allowing one-way flow of coolant through said transverse hole, and lower check valve means for normally allowing a positive pressure within the interior of the radiator, said lower check valve means being operable selectively to allow coolant to pass from said recovery overflow tank into the interior of the radiator as the pressure therein drops below atmospheric pressure and by forcing fluid through said outer bypass means.

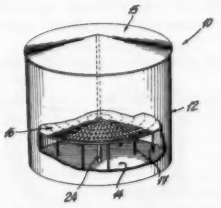
3,910,452
FLOATING COVER FOR A STORAGE TANK

I. Emery Szasz, Montreal, Canada, assignor to Edmund Sandborn, Westmount, Canada, a part interest

Continuation-in-part of Ser. No. 298,430, Dec. 1, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,687

Int. Cl.[2] B65D *87/20*

U.S. Cl. 220—226 **6 Claims**

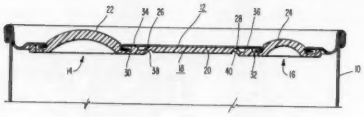


1. In a floating cover for a liquid storage tank, a generally circular planar platform formed of a plurality of concentric groups of interconnected panels made of cellular foam plastics, said panels being identically shaped in the form of an isosceles triangle with two equal sides and a base; each said panel including, along one side, a male engaging profile and, along the other side, a female engaging profile, said profiles having correspondingly shaped cross-sections whereby adjacent panels may be interconnected in side-by-side relation to form a concentric group; inter-engaging profile means on said bases to connect the bases of panels of one concentric group with the bases of panels of a radially adjacent concentric group.

3,910,453
EASY OPENING CAN END WITH PUSH-IN TABS

Raymond H. P. Kneusel, Flourtown, Pa., and Vinson S. Potts, Cherry Hill, N.J., assignors to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Oct. 10, 1974, Ser. No. 513,723
Int. Cl.[2] B65D *41/02*
U.S. Cl. 220—260 11 Claims

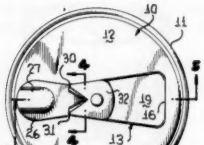


1. A can end of the easy opening type comprising:
an end panel having an opening therein including a downwardly extending curl having an edge substantially surrounding said opening; and
a plastic push tab member comprising a support portion affixed to the underside of said end panel adjacent said opening, a hinge portion attached to said support portion and freely movable downwardly away from said underside of said end panel, a sealing portion attached to said hinge portion and spaced from said support portion, said sealing portion spaced radially outwardly from said curl and substantially surrounding said opening and in substantial sealing engagement on the underside of said end panel so as to substantially isolate said edge from the contents of a can closed by the can end and a plug portion extending upwardly into the opening centrally of said sealing portion and said curl.

3,910,454
SELF CONCEALING NON DETACH EASY OPEN END DEVICE

James B. W. Novak, Glen Ellyn, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed June 12, 1974, Ser. No. 478,611
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—269 17 Claims

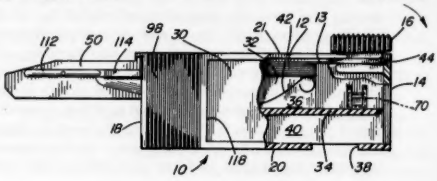


1. An easy opening end unit for a container or the like comprising an end panel, a weakening line in said end panel defining a tear panel at least partially removable out of the plane of said end panel, a pull tab, means joining said pull tab to said tear panel, and said pull tab having means for rupturing said end panel generally along said weakening line and outboard of said tear panel to perform a venting function prior to the at least partial removal of said tear panel from said end panel.

3,910,455
RAZOR BLADE DISPENSER

Frank A. Ferraro, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 330,368, Feb. 7, 1973, abandoned. This application Dec. 10, 1973, Ser. No. 423,626
Int. Cl.[2] B65D *83/10*
U.S. Cl. 221—102 6 Claims



1. In a safety razor blade dispenser of the type in which the uppermost blade in a stack of blades is adapted to be pushed edgewise into shaving position in a head of an associated razor, the combination comprising:
a horizontally elongated body of molded plastic having top and bottom walls, a pair of side walls extending between said top and bottom walls, and a forward end wall extending between said side walls at one end of said body. the other end of said body being opened between said side walls,
said stack of blades being located within and extending longitudinally of said body,
said forward end wall having a blade exit aperture formed therein,
said top wall including a longitudinal slot formed therein, and a downwardly directed longitudinal extending rib on each side of said slot,
a blade pusher of molded plastic slidable in said slot and including (1) a blade-engaging portion below said top wall for engaging the uppermost blade in said stack of blades when said pusher is moved from a rearmost position in said slot forwardly to push the uppermost blade through said blade exit aperture, and (2) a finger-engageable portion above said top wall,
an end closure member of molded plastic positioned in said opened end of said body, said end closure member comprising a pair of grooves in an upper rear surface of said end closure member respectively having seated therein a rear portion of each one of the downwardly directed ribs, upper portions of said closure member nested between the outer sides of the downwardly directed ribs and said side walls of said body, and a forwardly extending elongated member for biasing said blade-engaging portion upwardly when said pusher is in said rearmost position in said slot, said elongated member being spaced downwardly from said top wall, and
means in said body for biasing said stack of blades upwardly against the downwardly directed ribs to position the uppermost blade in a horizontal plane defined by said exit aperture when said pusher is in said rearmost position in said slot.

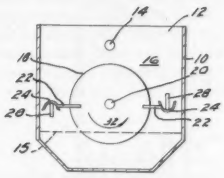
3,910,456
SEED EXTRACTING MEANS FOR PLANTERS

Christoffel Johannes Deysel, Buckingham, South Africa, assignor to Deysel 32 Implemente Limited, South Africa

Filed Mar. 14, 1974, Ser. No. 451,320
Claims priority, application South Africa, Feb. 23, 1973, 73/1303
Int. Cl.[2] A01C *7/08*
U.S. Cl. 221—254 7 Claims

1. Means for controlled removal and release of seeds from an at random supply of seeds within a container having an internal surface with a seed discharge and lead-off opening at a position spaced from a portion on which the supply is con-

centrated, including a seed receptacle mounted on a resilient arm for movement within the container to cyclically pass through the seed supply and across the said surface and the opening, the seed receptacle being held by the resilient arm in close spaced relationship to the said surface of the container and relative to which surface the arm is disposed in wide spaced and substantially parallel relationship whereas the receptacle presents an open end directed in the direction of

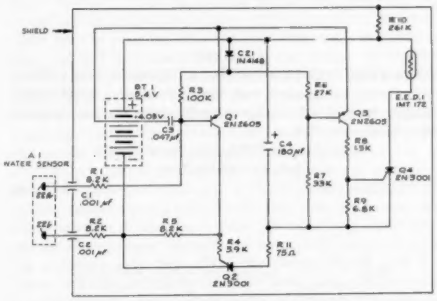


movement thereof and an open side directed towards the said surface whereby a single seed becomes lodged in the receptacle, when passing through the seed supply, for withdrawal of the seed from the supply and transference along the surface to the opening into which it is directed for discharge; the receptacle being also displaceable away from the said surface against the resiliency of the arm to accommodate seeds of different thicknesses.

3,910,457
ELECTRONIC WATER-ACTIVATED PARACHUTE RELEASE AND LIFE VEST INFLATOR

Roderick W. Sutliff, Petaluma, and David W. Edwards, Novato, both of Calif., assignors to H. Koch & Sons, Inc., Anaheim, Calif.

Filed May 6, 1974, Ser. No. 467,298
Int. Cl.² B67B 7/24
U.S. Cl. 222—5 **22 Claims**



1. A water-sensitive energizing electrical circuit for detonating electrical explosive devices upon immersion in water comprising, in combination,

a source of electrical current,

a first means of generating an electrical current pulse at an output,

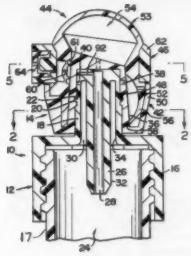
a switching means for minimizing current leakage from said current source prior to immersion of said circuit in water and for switching said first means to generate a current pulse responsive to immersion in water, said switching means being connected between said current source and said first means,

and a temperature compensation means for minimizing temperature dependence of said first means and said switching means respectively, said temperature compensation means being connected between said current source and each of said means respectively.

3,910,458
FINGER PUMP

Ronald F. Ewald, Rolling Meadows, Ill., assignor to Seaquist Valve Company, Cary, Ill.

Filed May 6, 1974, Ser. No. 467,585
Int. Cl.² B67D 5/42
U.S. Cl. 222—41 **27 Claims**



1. A finger pump for mechanically dispensing fluid product from a supply container, said pump comprising: a pump housing, a pump mechanism attached to said pump housing, said pump mechanism comprising a fluid supply chamber, a fluid discharge chamber, a pump reservoir and a pump member, said fluid supply chamber and said fluid discharge chamber both formed in said pump mechanism in spaced substantially segregated relation to one another and both disposed laterally about the outer periphery of said pump mechanism, said fluid supply chamber communicating with the interior of the supply container and said pump reservoir, a discharge orifice formed in said pump mechanism, said fluid discharge chamber disposed in fluid communication with said pump reservoir and said discharge orifice and out of direct fluid communication with said fluid supply chamber; said pump member movable between a first and second position to draw product from the interior of the supply container through said fluid supply chamber into and through said pump reservoir, said fluid discharge chamber and out said discharge passage.

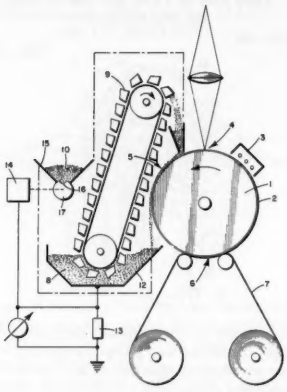
3,910,459
APPARATUS FOR MONITORING AND REPLENISHING TONER CONCENTRATIONS

Hartmut Bock, Fischbach, Helmut Stieger, Wiesbaden; Helmut Jahn, Frankfurt, Hausen, and Detlef Winkelmann, Wiesbaden-Biebrich, all of Germany, assignors to Hoechst Aktiengesellschaft, Wiesbaden, Germany

Filed Sept. 25, 1972, Ser. No. 292,254
Claims priority, application Germany, Sept. 25, 1971, 2147948
Int. Cl.² B67D 5/08; G03G 15/16
U.S. Cl. 222—56 **6 Claims**

1. A toner dispensing and control system for use in an electrophotographic reproduction apparatus having a photoconductor, a container for the toner, a cascade developer means consisting of a developer zone, a developer container, and a bucket conveyor system for replenishing the developer zone with toner, first means for dispensing toner from the container into said cascade developer means, an actuator device associated with the said first dispensing means for controlling the introduction of the toner into said cascade developer means, means for sensing the electrical charging rate of the material in said cascade developing means comprising the said cascade developer means arranged as a whole as an insulated electrically conductive element to receive a steady stream of carrier material, which is charged opposite to the toner deposited on said photoconductor, image-wise charged and over which the developer is cascaded, said sensing means including measuring means and means to be charged in accordance with the charge flow of the carrier material received by said cascade developing means, said means to be charged having one end connected to the devel-

oper container and the other end connected to ground, said actuator device associated with said first dispensing means being actuated, in accordance with the flow of a charge cur-



rent due the applied voltage across the means connected to said developer container and to ground, when the amount of the said charge current during the developing operation falls outside of the range of two limiting values.

3,910,460

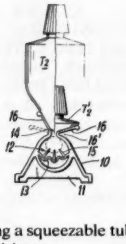
DEVICE FOR HOLDING AND SQUEEZING TUBES

Else Hausmann, and Heinrich Hausmann, both of 3 Hegauweg 7893, Jestetten/Baden, Germany

Continuation of Ser. No. 206,637, Dec. 10, 1971, abandoned. This application Aug. 21, 1973, Ser. No. 389,641

Int. Cl. B65d *35/34*

U.S. Cl. 222—99 **3 Claims**



1. A device for holding a squeezable tube and extracting the contents thereof comprising:

a turning key having a tube receiving slot therein on which the tube can be rolled up;

a one piece plastic housing defining an opening which is at least partially cylindrical and which extends completely therethrough and a slit through the housing that extends axially along the cylindrical opening whereby one end of the tube can be inserted into the opening and engaged therein by the turning key, the opening being of sufficient diameter to accommodate the turning key with the tube at least partially rolled up thereon; and

a plurality of elastically deformable upstanding plastic ribs contained completely within said opening and integrally formed with the housing, said ribs projecting toward the center of the opening when in a relaxed state and positioned so as to be deformed outwardly against the walls of the housing by a tube and turn key inserted in the opening to prevent the tube from uncurling and to hold the tube and turn key within the opening.

3,910,461

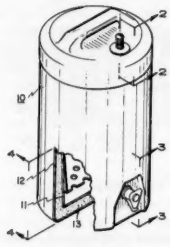
BEVERAGE CONTAINER STRUCTURE

Lee J. Eager, Hurricane, Utah, assignor to Jack O. Sim, Bountiful, Utah

Filed Jan. 25, 1974, Ser. No. 436,699

Int. Cl.² B65D *11/16, 51/16*

U.S. Cl. 222—131 **2 Claims**



1. A beverage container including, in combination, an outer container having a manually actuatable drain valve, a lid secured to and over said outer container, said lid including a gaseous pressure-relief valve, wherein said lid includes mutually spaced outer and inner walls, said inner wall being provided with air-passageway means, said relief valve being cooperatively disposed with respect to said outer wall, and wherein said outer and inner walls of said lid include aligned apertures, said pressure-relief valve comprising a valve disc centrally disposed over said aligned apertures and itself having a central aperture, said outer wall including at least one additional aperture disposed under said valve disc, elongate means disposed through said aligned apertures of said lid and said central aperture of said disc and having upper and lower reaction means, said lower reaction means coacting against said inner wall of said lid, and compression spring means disposed coaxially about said elongate means and operatively positioned between said upper reaction means and said outer wall of said lid.

3,910,462

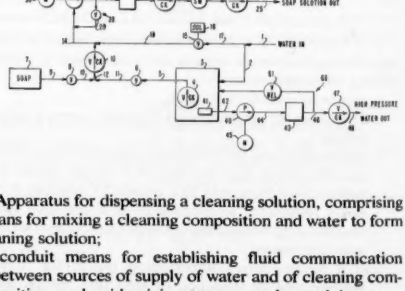
APPARATUS FOR DISPENSING CLEANING SOLUTION

R. M. Abeles, Douglaston, and Monte P. Henry, North Valley Stream, both of N.Y., assignors to Flushing Plastics Corporation, Hicksville, N.Y.

Filed June 6, 1974, Ser. No. 477,009

Int. Cl.² B05B *7/00*

U.S. Cl. 222—135 **8 Claims**



1. Apparatus for dispensing a cleaning solution, comprising a. means for mixing a cleaning composition and water to form a cleaning solution;

b. conduit means for establishing fluid communication between sources of supply of water and of cleaning composition and said mixing means, each conduit means including a valve means therein for controlling the throughput therethrough;

c. means for dispensing said cleaning solution under pressure;

d. first pump means downstream of said mixing means for pumping said water and said cleaning composition to said mixing means via said conduit means and for pumping said cleaning solution from said mixing means to said dispensing means, said first pump means having an inlet and an outlet, said pump means inlet being connected in fluid communication with said mixing means and said pump means outlet being in fluid communication with said cleaning solution dispensing means; and

e. rinse means for dispensing water at a higher pressure than the cleaning solution dispensed from said cleaning solution dispensing means, including second pump means for pumping water from said supply of water through said rinse means.

3,910,463

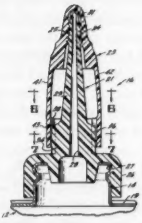
CLOSURE FOR LIQUID CONTAINER

Stanley Reese, Cincinnati, Ohio, assignor to Dome Chemical Corporation, Cincinnati, Ohio

Filed May 8, 1974, Ser. No. 468,207

Int. Cl.² B67B *5/00;* **B67D** *5/32*

U.S. Cl. 222—153 **1 Claim**



1. A closure for a liquid container which comprises a hollow spout member including a lower portion mounted on and in communication with the interior of the container, an intermediate tubular portion, and an upper externally threaded portion, radially outwardly extending rib means on the lower portion, a cap member including an upper portion threaded on the upper portion of the spout member, downwardly extending resilient strap portions, and an annular stop portion supported on the strap portions, and radially inwardly directed rib means on the stop portion, the rib means on the stop portion including a plurality of first rib members, each of said first rib members including a downwardly and outwardly sloping bevel face at a lower end thereof, the rib means on the lower portion of the spout member including a plurality of second rib members, each of said second rib members including a downwardly and outwardly sloping bevel face at an upper end thereof, the bevel faces being engageable to cause centering of the stop portion of the cap member on the lower portion of the spout member, the strap portions normally urging the stop portion to a position where the rib means are arranged to engage and lock the cap member on the spout member, the stop portion being displaceable from normal position for freeing the rib means.

3,910,464

IN-TANK FUEL PUMP SUPPORT UNIT AND ASSEMBLY

Manfred P. H. Schlanzky, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

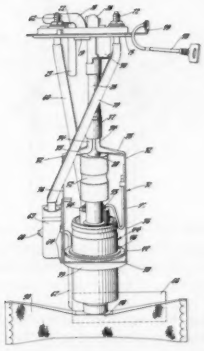
Filed Aug. 1, 1974, Ser. No. 493,497

Int. Cl.² A01C *15/00*

U.S. Cl. 222—180 **5 Claims**

1. A fuel pump assembly for mounting in a fuel tank with an access opening through its top wall, the fuel pump assembly comprising, in combination:

an access opening cover adapted to close the access opening; a rigid conduit fixed to and projecting downward through the access opening cover into the tank; a bracket fixed to the rigid conduit within the tank, the bracket supporting a generally horizontal seat below the lower end of the rigid conduit; a resilient member in the seat; an axial flow fuel pump retained in the seat in a vertical attitude by the resilient member, the fuel pump having an



inlet at its lower end near the bottom of the tank and an outlet at its upper end; a flexible conduit connecting the pump outlet with the lower end of the rigid conduit; the pump further having means about its periphery to engage the resilient member so as to prevent downward movement of the pump through the seat but allow upward movement of the pump out of the seat upon the application of a large upward or horizontal force to the pump.

3,910,465

PRODUCT PRESSURIZED COMPRESSED AIR DISPENSER

Herbert H. Loeffler, Arlington, Mass., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,946

Int. Cl.² B67D *5/54*

U.S. Cl. 222—193 **14 Claims**

1. A dispenser for dispensing a fine spray by means of compressed air, comprising:

a body having a dispensing nozzle means therein for mixing and dispensing a fluent product and compressed air,

a piston-cylinder means depending from said body and having a fixed member in said body and a movable member movable relative to said fixed member for compressing air therebetween, said fixed member having a fluent product containing recess therein opening toward said movable member,

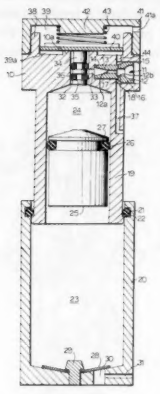
a product pressurizing piston in said product containing recess having an end exposed toward said movable member,

said body having a product flow path therethrough from said product containing recess to said nozzle means and a product control valve means in said product flow path for controlling flow of product therethrough,

said body further having a compressed air flow path therethrough to said nozzle means and compressed air valve means in said compressed air flow path which is opened near the end of the movement of said movable means for releasing compressed air at a predetermined pressure into said compressed air flow path, and

a product valve actuator coupled to said product valve, said compressed air flow path opening to said product valve

actuator and said product valve actuator being movable in response to the pressure of the compressed air for opening said product valve,



whereby when the movable member is moved toward the fixed member for compressing air the compressed air acts on said product pressurizing piston for pressurizing the product, and compressed air at a predetermined pressure is released to said flow path, said valve actuator is moved to open said product valve.

3,910,466

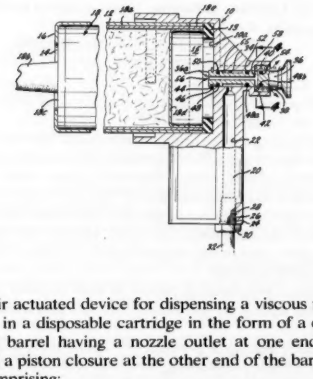
AIR ACTUATED PLASTIC COMPOUND DISPENSING DEVICE

Roland W. Collar, Sun Valley, Calif., assignor to Roean Industries, Pacoima, Calif.

Filed Jan. 9, 1974, Ser. No. 432,050

Int. Cl.[2] B67D *5/46*

U.S. Cl. 222—327 **3 Claims**



1. An air actuated device for dispensing a viscous material contained in a disposable cartridge in the form of a cylindrical-walled barrel having a nozzle outlet at one end of the barrel and a piston closure at the other end of the barrel, said device comprising:

A. a cylindrical housing dimensioned to receive in a close fit and to retain said cartridge, said housing being partially closed but orificed centrally at one end to permit the cartridge nozzle to extend through said orifice, and the other end of said housing being open and provided with interlocking means;

B. a receptacle body member for receiving and securing the said other end of said housing therein, said receptacle body member having (i) a cylindrical socket cavity with an open end and a closed end, to receive the said other end of said housing after one of said cartridges has been inserted in said housing, and (ii) means cooperating with said interlocking means to removably secure said housing end in said socket cavity and in abutment witht the portion of the body member defining said cavity, an orifice in said receptacle body member, said orifice extending axially therethrough from the socket cavity to communicate with a counterbore extending coaxially from the after end of said socket, and said receptacle body member being transversely orificed from said axial orifice to a point outside said receptacle body member to provide an air inlet passage connectable to a source of air under pressure; and

C. a plunger type valve, said valve being slidably disposed in said axial orifice and counterbore and extending from said socket cavity to a point beyond the after end of said body member, said valve being axially orificed from its socket cavity end to a point on said valve in said counterbore, and a transverse bore in said valve at the last said point, and said valve further having a pair of axial extents spaced from each other and fitting closely in said orifice, and an intermediate axial extent between said pair of axial extents of lesser diameter than that of said orifice to constitute an annulus in said plunger valve, and said valve being provided with means at its end extending into the socket cavity to prevent said end from being drawn into said axial orifice, said valve being slidable in said axial orifice from a first position into which said valve is biased, wherein said air under pressure entering said body member through said transverse orifice is confined to said annulus and is thereby prevented from developing a pressure force in said socket cavity through said axial orifice, and said socket cavity is vented through the axial orifice in said valve to the atmosphere in said counterbore at the rear of said body member, to a second position, accomplished by being pushed manually forwardly into said body member from the rear thereof, wherein said annulus is placed in communication with both said socket and said air inlet passage and venting through said axial valve orifice is prevented by shifting the transversely bored valve area inwardly from said counterbore into said axial orifice, thereby, while said venting is thus prevented, the air under pressure is directed into said socket behind said cartridge piston to build up pressure in said socket, to force the said piston down the cartridge barrel within said cylindrical housing to extrude the viscous material through the cartridge nozzle.

3,910,467

PRESSURE DISPENSING DEVICE WITH METERING TRAP CHAMBER

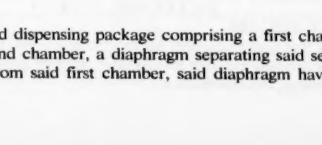
Billy Nilson, Finnstugatan 30, 595 00 Mjolby, Sweden

Filed Dec. 14, 1973, Ser. No. 424,914

Claims priority, application Sweden, Dec. 15, 1972, 16497/72

Int. Cl.[2] G01F *11/08*

U.S. Cl. 222—449 **4 Claims**



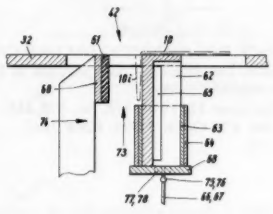
1. A fluid dispensing package comprising a first chamber and a second chamber, a diaphragm separating said second chamber from said first chamber, said diaphragm having a

narrow opening, a valve element positioned in said second chamber for engaging and closing said diaphragm opening, said diaphragm having in its untensioned condition its opening out of contact with said valve element, said second chamber having an opening, a second diaphragm closing said second chamber opening, said second diaphgram having an opening, a second valve element provided in said second chamber and normally closing said second diaphgram opening, the arrangement of said diaphgrams being such that a pressure exerted upon a fluid substance contained in said first chamber causes such substance to pass from said first chamber via the opening of said first diaphgram into said second chamber at the same time deforming said diaphgram of first chamber, thereby successively approaching the opening of said diaphgram to said first valve element and finally engaging the same to close said opening, the diaphgram of said second chamber being in its normal condition resiliently pressed against said second valve element and provided to open in response to the pressure to the substance contained in said second chamber and to close when said pressure ceases.

3,910,468
DEVICE FOR IRONING SHIRTS OR SIMILAR ARTICLES OF CLOTHING

Heinrich Knappe, Eidinghausen, Germany, assignor to Herbert Kannegiesser Kommanditgesellschaft, Vlotho, Germany

Filed Mar. 12, 1974, Ser. No. 450,508
Claims priority, application Germany, Mar. 17, 1973, 2313350
Int. Cl.² D06C *15/00*
U.S. Cl. 223—52.1 **7 Claims**



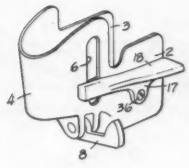
1. A device for pressing shirts or similar articles of clothing comprising:
   a. a first collar pressing element (**62**);
   b. a plurality of movable collar pressing elements (**63, 64**) disposed coaxially about said first collar pressing element (**62**), each movable collar pressing element being movable with respect to the first collar pressing element and with respect to the other movable collar pressing elements;
   c. means to selectively move said movable collar pressing elements;
   d. a pressing shoe (**60**) movable between a first position away from said pressing elements and a second position in contact with one of said pressing elements; and
   e. means to move said pressing shoe between said first and second positions.

3,910,469
HOLSTER FOR HAND GUNS

Archie Baldocchi, San Salvador, El Salvador, Central America

Filed Mar. 5, 1974, Ser. No. 443,215
Int. Cl.² F41C *33/02*
U.S. Cl. 224—2 C **9 Claims**

1. In a holster for a hand gun having a handle, trigger guard and a barrel,
   a hollow holster body of generally U-shaped cross section straddling the trigger guard and adjacent portions of said barrel and completely enclosing the trigger guard therein, the open end of said body being positioned adjacent the barrel thereby to permit the drawing of the handgun by forward rotating motion outwardly from said open end,
   a releasable latch element on one side of said holster body, said latch element having a pivot portion and a projecting end portion projecting into the trigger guard so as to prevent withdrawal of the hand gun from said holster body, said element being pivotably movable into and out of said projecting position,

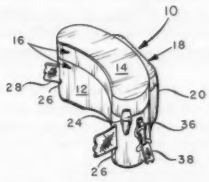


   a safety member on said one side for holding said latch element in said projecting position by engagement with a portion thereof adjacent said projecting end portion,
   means to mount said safety member on said one side so as to be in position engageable by the user simultaneously with the gripping of said handle for moving said safety member for releasing said latch element,
   a holster support on the other side of said holster body,
   and means adjustably to secure said holster support to said holster body for a selected angle of drawing said hand gun.

3,910,470
CARRYING CASE FOR PHOTOGRAPHIC EQUIPMENT AND THE LIKE

Carl O. Swenson, 22376 Algunas Road; William E. Sturgis, 22355 Algunas Road, both of Woodland Hills, Calif. 91364, and Richard L. Moran, 4319 Alcove St., Studio City, Calif. 91604

Filed Mar. 11, 1974, Ser. No. 449,687
Int. Cl.² A45F *5/00*
U.S. Cl. 224—5 V **12 Claims**



1. An equipment carrying case comprising:
   a hollow base portion having a first concavely curved side and a second generally convexly curved side;
   retention means attached to said base portion for securing said case against the body of the user to substantially obviate movement relative to the body;
   a hollow lid portion shaped to mate with said base portion; hinge means upon said generally convexly curved side and connecting said base portion to said lid portion to permit said lid portion to open away from the body;
   latch means upon other than said concavely curved side of said base and lid portions to cooperatively and releasably retain the same in a closed position and permit access thereto without bodily interference; and
   cushion material lining said base portion and said lid portion to cushion equipment stored therein.

3,910,471
CYCLE LUGGAGE CARRIER AND HOLDING STRAP COMBINATION

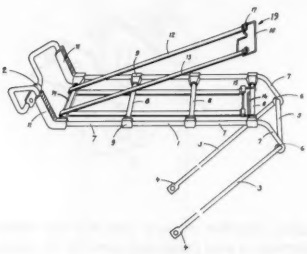
Heinz Niemann, Herford, Germany, assignor to Firma ESGE-Marby GmbH & Co., Bielefeld, Germany

Filed May 28, 1974, Ser. No. 473,362

Claims priority, application Germany, Aug. 17, 1973, 2341586

Int. Cl.[2] B62J *7/08*

U.S. Cl. 224—39 **10 Claims**



1. Cycle luggage carrier and holding strap combination comprising

an elongated grid structure defining an article carrying surface, said grid being formed by rod-like grid elements including longitudinal bars (**7**) and cross rods (**8**) and an elastic hold-down strap means (**12, 13**) adapted for connection to a cross rod, looping over articles to be carried on the surface, and releasable re-attachment to a cross rod, wherein a first hook (**16**) is connected to one end (**15**) of the strap means, and hooked from below around a cross rod adjacent one end of the grid structure, the strap then passing beneath the cross rods (**8**) around that cross rod which is closest to the other end of the grid structure and then passes above the cross rods of the grid structure; and a second hook (**19**) and a handle (**18**) are provided, connected to the second end (**17**) of the strap means, said second hook being engageable with a cross rod of said grid structure,

and wherein the second hook (**19**) comprises a wire structure formed of a first wire element (**22**) having a U-shaped central part (**18**) forming said handle, the terminal ends (23) of the legs of said U being bent inwardly;

a second wire element (**20**) having a U-shaped central part (**21**), the legs of the U being bent over themselves to form said hook;

the terminal end (**23**) of the U of the first wire element being secured to the legs of the U of the second wire element (**20**, said inwardly bent terminal ends forming attachment strips for the strap (**12, 13**).

3,910,472
CARRYING CASE FOR SPORTS KIT

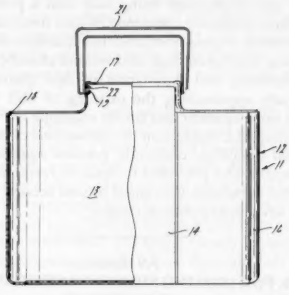
Ronald D. Russo, Colchester, Conn., assignor to King-Seeley Thermos Co., Norwich, Conn.

Filed Apr. 8, 1974, Ser. No. 458,538

Int. Cl.[2] A45C *11/20*

U.S. Cl. 224—45 R **3 Claims**

1. A sports kit for carrying vacuum bottles and a sandwich box or the like comprising a case formed from a single piece of molded plastic, said case defining a first, centrally placed opening configured to receive a sandwich box, second and third openings disposed on respective opposite sides of said first opening and each being configured to receive a vacuum bottle, said first opening being defined in part by upstanding walls extending from a point contiguous to said second and third openings whereby said first opening is positioned vertically above said second and third openings, said walls dividing said first, second and third openings from each other, and a carrying handle affixed to said case, said carrying handle having projections extending through apertures in said upstanding walls for pivotally connecting said carrying handle to said case, said apertures in said upstanding walls being positioned contiguous to the center of the sides of said first opening, said handle being pivotal from a carrying position in which it spans said first opening to a second position clear of said first opening for facilitating the insertion and removal of a sandwich box from said first opening, said carrying handle being positioned clear of said second and third openings in each of its positions whereby vacuum bottles may be inserted and removed from said second and third openings regardless of the position of said handle.



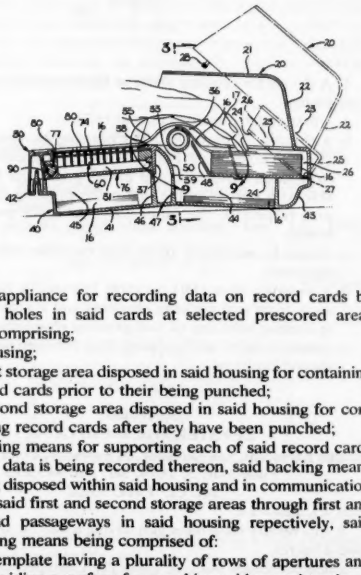
3,910,473
APPLIANCE FOR PUNCHING RECORD CARDS

George M. Colon, Los Angeles, Calif., assignor to Data Entry Systems, El Segundo, Calif.

Filed June 12, 1974, Ser. No. 478,445

Int. Cl.[2] G06K *21/06;* **B26F** *1/02*

U.S. Cl. 225—93 **14 Claims**



1. An appliance for recording data on record cards by punching holes in said cards at selected prescored areas thereof, comprising;

a. a housing;

b. a first storage area disposed in said housing for containing record cards prior to their being punched;

c. a second storage area disposed in said housing for containing record cards after they have been punched;

d. backing means for supporting each of said record cards while data is being recorded thereon, said backing means being disposed within said housing and in communication with said first and second storage areas through first and second passageways in said housing repectively, said backing means being comprised of:

i. a template having a plurality of rows of apertures and providing a surface for punching said record cards;

ii. a plurality of resilient strips disposed beneath said template, said strips having between each pair thereof a small gap, said gaps being disposed beneath corresponding rows of said apertures; and

iii. a support structure disposed beneath said strips and providing support thereto; and

e. a rotatable cylindrical roller disposed within said housing so as to engage said record cards as they pass through said first and second passageways, whereby, said unpunched record cards are manually forced from said first storage area to the surface of said backing means through said first passageway and, after having data punched thereon, said cards are manually forced from said backing means to said second storage area through said second passageway, said backing means removing all chads produced by punching said cards.

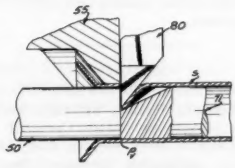
3,910,474
TUBING SEVERING TOOL

John O. King, Jr., 3990 N. Ivy Road, Atlanta, Ga. 30342

Division of Ser. No. 274,613, July 24, 1972, Pat. No. 3,803,895, which is a continuation-in-part of Ser. No. 882,126, Dec. 4, 1969, Pat. No. 3,679,109, which is a continuation-in-part of Ser. No. 711,368, March 7, 1968, abandoned. This application Apr. 5, 1974, Ser. No. 458,216

Int. Cl.² B65H *17/28*

U.S. Cl. 225—96.5 **9 Claims**



1. Apparatus for adjusting the length of thin walled tubular sleeves including:

an internal support mandrel slidably receivable into the tubular sleeve from one end thereof having an external support surface with a configuration conforming to the internal configuration of the sleeve to internally support the sleeve about the circumference thereof and a projecting end selectively aligned with that plane at which the sleeve is to be severed, said support mandrel defining a piercing recess therein adjacent to and opening onto both said projecting end and said external support surface adjacent said projecting end so that that portion of the sleeve overlying said piercing recess is not internally supported;

a piercing member including a piercing point, said piercing point having a piercing tip thereon constructed and arranged to pierce the sleeve in that plane at which the sleeve is to be severed in alignment with said projecting end of said internal support member and said recess therein; and,

carrier means mounting said internal support mandrel and said piercing member so that said piercing tip is in alignment with said projecting end of and said recess in said internal support mandrel when said piercing tip pierces the sleeve for selectively moving said piercing member toward the sleeve to cause said piercing tip to first pierce the sleeve at that plane along which the sleeve is to be severed, and then to force a portion of the sleeve adjacent said plane into said recess on said internal support mandrel.

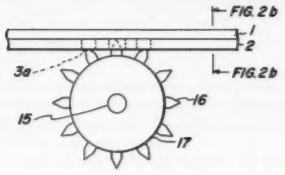
3,910,475
SYSTEM FOR ELECTRICALLY GROUNDING OR BIASING A MEMBER

Arnold L. Pundsack, Rochester, and Jerome N. Harris, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 15, 1973, Ser. No. 341,653

Int. Cl. B65h *17/38*

U.S. Cl. 226—6 **52 Claims**



52. A method of electrically grounding or biasing an advancing web comprising:

a. providing an advancing web comprising an insulating layer and a conductive layer and at least one indent in and at least through said insulating layer; and

b. temporarily contacting an electrically grounded or biased conductive element with said indent from the insulating side of said advancing web sufficiently to physically contact said element with said conductive layer whereby said element electrically grounds or biases said advancing web.

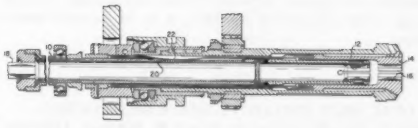
3,910,476
KEYED PUSHER TUBE AND COLLET ASSEMBLY

Chester S. Zajac, 8010 Sierra Oval, Parma, Ohio 44130

Filed Apr. 30, 1974, Ser. No. 465,697

Int. Cl.² B65H *17/36*

U.S. Cl. 226—158 **2 Claims**

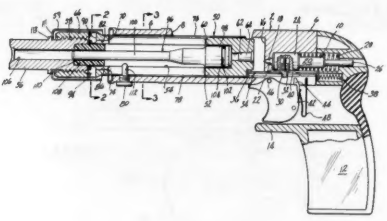


1. A stock feed pusher tube and collet assembly positionable in a spindle of an automatic screw machine for feeding stock through the machine, said assembly comprising: an elongated pusher tube having a longitudinal open-ended bore of predetermined non-circular configuration in transverse section; an elongated collet, the pusher tube being telescoped within the collet for longitudinal and circumferential sliding movement therein, said collet having an open-ended bore of said predetermined non-circular configuration in transverse section; and coacting releasable locking means on the tube and collet for circumferentially locking the tube in the collet in a preselected position, whereby the tube bore and the collet bore are aligned circumferentially enabling associated elongated stock having said predetermined non-circular configuration to be fed through the coacting tube and collet, and wherein said locking means includes a key-slot structure wherein the tube has a longitudinal key slot, and said collet has a coacting resilient key releasably positionable in said slot to align and releasably lock the tube and collet circumferentially.

3,910,477
POWDER-ACTUATED TOOL

Vladimir Kavan, Toronto, Canada, assignor to Olin Corporation, New Haven, Conn.

Filed May 6, 1974, Ser. No. 467,338
Int. Cl. B25c *1/14*
U.S. Cl. 227—10 5 Claims

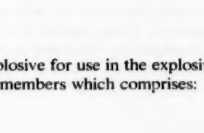


1. A powder-actuated fastening tool including a housing having a forward tubular portion, a barrel assembly having a bore therein mounted for reciprocal movement between a breech open position and a breech closed position, a piston member in said bore moveable between a driving position and a driven position, a propellant charge receiving chamber in the breech end of the barrel assembly, a slot through the wall of the barrel assembly extending from a rearward point forward of said propellant charge receiving chamber to a point spaced axially rearwardly of the forward end of said housing when said barrel assembly is in its breech closed position, a pawl member mounted on said housing and having a portion extending through said slot into the bore in said barrel assembly, a groove in the interior wall of said barrel assembly extending from the forward end of said slot to a forward point which is axially forward of the forward end of said housing when said barrel assembly is in its breech closed position, at least one groove in the internal wall of the bore of said barrel assembly extending from a point forward of said propellant charge receiving chamber to a point axially forward of the forward end of said housing when said barrel assembly is in its breech closed position, and port means in said barrel assembly providing communication between all of said grooves and the atmosphere at a point forward of the forward end of said housing when said barrel assembly is in its breech closed position.

3,910,478
DUAL HIGH EXPLOSIVE SHAPE DETONATION

William G. Howell, Lakewood; Robert H. Wittman, Littleton, and Theodore A. Espinoza, Denver, all of Colo., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 340,132, March 12, 1973, abandoned. This application Sept. 20, 1973, Ser. No. 398,941
Int. Cl.[2] B23P *3/09*
U.S. Cl. 228—2.5 11 Claims



1. A dual high explosive for use in the explosive welding of abutting cylindrical members which comprises:

a welding explosive mass circumferentially located on a metallic substantially cylindrical sleeve surrounding the abutting members;

said welding explosive mass comprising a circumferential body of high explosive and having a greater thickness at its center than at its ends transversely disposed of said center such that upon initiation the maximum explosive impact is exerted inwardly toward said sleeve;

initiating explosive means arranged on said body at least at its center and extending circumferentially therearound in explosive contact with said body;

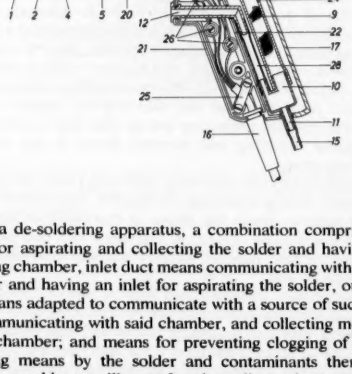
at least two equidistantly spaced apart detonators in operable contact with said initiating explosive means and adapted to be connected to a source of energy, said detonators being arranged for causing a symmetrical blast load to be applied to said members upon energization thereof; and

said initiating explosive means having a detonation velocity substantially greater than that of said welding explosive mass such that upon detonation of said initiating explosive and said welding explosive by the simultaneous energization of said detonators there emanates from each of said detonators at said spaced apart locations at least a pair of opposed wedge-shaped wave fronts which travel in opposite directions about said sleeve and impact at about halfway between said detonators with a corresponding one of the wave fronts emanating from the other of said detonators and wherein the apex of each of said wave fronts is caused by said initiating explosive and the remaining portion of each of said wave fronts which flanks the apex thereof is caused by said welding explosive upon detonation thereof, for causing said collar to weld to said abutting members.

3,910,479
DE-SOLDERING APPARATUS

Franz Kohler, Wertheim 1 Main, Germany, assignor to Ersa Ernst Sachs KG, Wertheim 1 Main, Germany

Filed Dec. 7, 1973, Ser. No. 424,234
Claims priority, application Germany, Dec. 16, 1972, 2261646
Int. Cl.[2] B23K *3/04*
U.S. Cl. 228—20 13 Claims



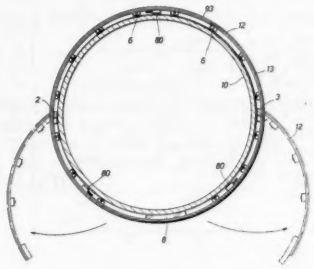
1. In a de-soldering apparatus, a combination comprising means for aspirating and collecting the solder and having a collecting chamber, inlet duct means communicating with said chamber and having an inlet for aspirating the solder, outlet duct means adapted to communicate with a source of suction and communicating with said chamber, and collecting means in said chamber; and means for preventing clogging of said aspirating means by the solder and contaminants thereof, including a solder-repelling surface bounding at least part of said inlet duct means, and heating means for heating a region of said inlet duct means to a temperature sufficient for reducing the contaminants to ashes, said inlet duct means having a cross section which step-wise increases from said inlet to said

chamber whereby the advancement speed of the aspirated solder through said inlet duct means decreases from an aspiration speed at said inlet to a reduction speed in said region so that the dwell time of the solder in said region is sufficient for reducing the contaminants in the solder to ashes, and to a collection speed at said collecting means so that the solder and the ashes are collected thereby.

3,910,480
CIRCUMFERENTIAL TRACK AND BAND ASSEMBLY WITH QUICK RELEASE

Russell S. Thatcher, Alvin, Tex., assignor to Central Welding Supply Co., S. Houston, Tex.

Filed May 6, 1974, Ser. No. 467,584
Int. Cl.[2] B23K *37/02, 5/08*
U.S. Cl. 228—45 **9 Claims**



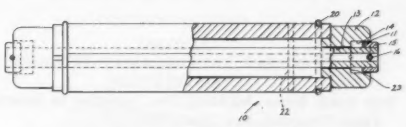
1. A track assembly adapted to support welding apparatus for operation about the circumference of a pipe, comprising:
a plurality of rigid, arcuate plate sections pivotally connected to one another to define a band having first and second ends;
latch means including latch elements mounted proximate each of said ends for engagement with one another to secure said band circumferentially about a pipe, said latch means including means for initially engaging said latch elements and means for moving at least one of said latch elements with respect to said band for tightening said band on the pipe;
first roller means mounted on said band for rolling engagement with the pipe when said band is disposed circumferentially about the pipe, said first roller means being mounted for axial movement of said band with respect to the pipe; and
second roller means mounted on said band for rolling engagement with the pipe when said band is disposed circumferentially about the pipe, said second roller means being mounted for arcuate movement of said band with respect to the pipe and to support said band a predetermined uniform distance from the pipe when said band is tightened on the pipe.

3,910,481
COLLAPSIBLE BACK-UP TOOL

John M. Urbanic, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 11, 1974, Ser. No. 531,528
Int. Cl.[2] B23K *37/04*
U.S. Cl. 228—49 **7 Claims**

1. A collapsible alignment and back-up tool for adjacent ends of tubular members to be butt-joined together comprising
an assemblage expandable into and collapsible from a condition defining an elongate and substantially cylindrical member and adapted to be positioned in expanded condition within end abutted adjacent ends of a pair of tubular members prior to joining said ends together with the outer generally cylindrical surface portions of the assemblage disposed in substantially surface-to-surface engaging relation with the inner surface portions of said adjacent ends of said tubular members,
said tool being constructed of
a shaft,
a pair of end plugs slidably mounted on said shaft and each having a shoulder portion encompassing said shaft and extending toward the other plug, and

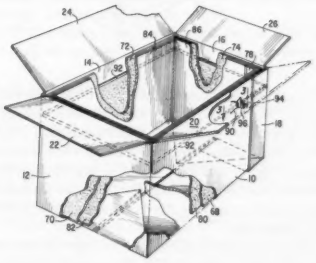


a plurality of adjacent interengaging arcuate segments forming said substantially cylindrical surface in said expanded condition when opposed ends of said segments are supported by said shoulder portions,
said shaft and said segments being formed of relatively non-magnetic material and each of said end plugs being formed of relatively magnetic material to cause said plugs to move relative to said shaft in opposite directions and collapse said surface when the tool is subjected to the influence of a magnetic field.

3,910,482
LAMINATED CONTAINER

Robert A. Bamburg, West Monroe, La., and Harry K. Hubenthal, Fulshear, Tex., assignors to Olinkraft, Inc., West Monroe, La.

Filed Nov. 29, 1973, Ser. No. 420,183
Int. Cl.[2] B05D *13/00*
U.S. Cl. 229—14 R **11 Claims**

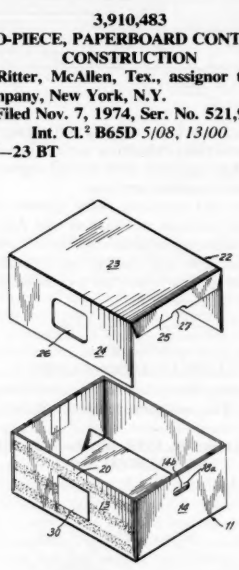


1. A laminated container comprising
an outer box having five serially hinged side panels, a bottom, and a top, one of said outer box side panels being on one end of the series of outer box side panels for overlapping the outer box side panel on the other end of the series of outer box side panels to form a joint, said outer box side panels having a tear strip extending longitudinally along the series of outer box side panels a predetermined distance below the top for separating a top portion of the outer box from a lower portion of the outer box;
an intermediate liner; and
an inner liner;
one of said intermediate liner and said inner liner having four serially hinged panels, the ends of the series of one liner panels forming an abutting corner joint without any substantial separation of the abutting ends of the series of one liner panels;
the other of said intermediate liner and said inner liner having five serially hinged panels, the end panels of the series of other liner panels having a combined size corresponding to a respective one of the panels of said one

liner and forming an abutting side joint without any substantial separation of the abutting ends of the series of other liner panels;

said outer box side panels, said intermediate liner panels and said inner liner panels forming respective plies of the sides of the container with the inner liner panels glued to respective intermediate liner panels and lower portions of the intermediate liner panels glued to the respective lower portions of the outer box side panels.

3,910,483
TWO-PIECE, PAPERBOARD CONTAINER CONSTRUCTION
Dale Louis Ritter, McAllen, Tex., assignor to International Paper Company, New York, N.Y.
Filed Nov. 7, 1974, Ser. No. 521,911
Int. Cl.[2] B65D *5/08, 13/00*
U.S. Cl. 229—23 BT **7 Claims**



1. In a generally rectangular container for relatively heavy materials, formed from: a tray member, which comprises a bottom panel, a pair of tray side panels and a pair of tray end panels, a hand hole being provided in each tray end panel; and a telescoping lid member, which comprises a top panel, a pair of lid side panels overlying the tray side panels and a pair of lid end panels overlying the tray end panels, the improvement which comprises:

a cut-out in the lower edge of each lid end panel, aligned with and conforming to the upper, edge portion of the hand hole in each tray end panel;

each of the lid side panels overlying and being adhesively bonded to substantially an entire tray side panel; and

each of the lid end panels overlying and being adhesively bonded only to a minor, upper portion of each tray end panel, the minor portion constituting at least, substantially the entire area of the tray end panel outside of the hand hole and above the center of the hand hole in the tray end panel.

3,910,484
CARTON WITH EXTERIOR LEDGE
Roger M. Wozniacki, Brea, Calif., assignor to International Paper Company, New York, N.Y.
Filed Feb. 25, 1974, Ser. No. 445,350
Int. Cl.[2] B65D *5/22*
U.S. Cl. 229—34 R **9 Claims**

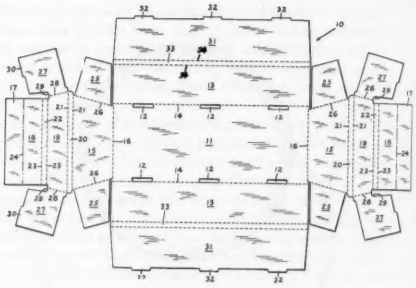
1. A carton comprising:

a bottom panel with foldably attached side and end wall panels, said bottom panel containing peripheral apertures;

outer ledge panels of a smaller height dimension than the end wall panels foldably attached to the top edge of the end wall panels and overlying the outer face of the end wall panels;

inner ledge panels of a smaller height dimension than the end wall panels attached to that edge of the outer ledge panels opposite that which attaches the outer ledge panels to the end wall panels, the inner ledge panels located between the outer ledge panels and the end wall panels, the outer and inner ledge panels cooperating to form at the top of each end of the carton a ledge on the carton exterior;

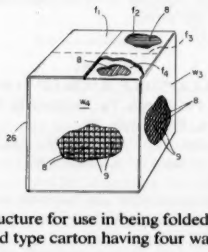
first corner connector panels foldably attached to opposite side edges of the end wall panels and overlying the inner face of the side wall panels;



second corner connector panels foldably attached to opposite side edges of the outer ledge panels and overlying the inner face of the side wall panels, the second corner connector panels located between the first corner connector panels and the side wall panels and having tabs which fit in the apertures of the bottom panel;

locking panels foldably attached to the top edge of the side wall panels and overlying the inner face of the side wall panels, the first and second corner connector panels located between the side wall panels and the locking panels, the locking panels having tabs at the bottom edge which fit in the apertures of the bottom panels to hold the locking panels in position.

3,910,485
SHIPPING AND STORAGE CARTON
Kurt Wandel, R.D. No. 1, Downingtown, Pa. 19335
Filed Oct. 10, 1973, Ser. No. 405,188
Int. Cl.[2] B65D *5/02*
U.S. Cl. 229—37 R **8 Claims**



1. A blank structure for use in being folded into a rectangular parallelepiped type carton having four walls and a bottom comprising:

a rectangular wall section for use in being folded to form the four walls of the carton and a rectangular shaped flap section integral with the wall section and disposed on one side thereof for use in being folded to form the bottom of the carton;

the wall section being comprised of a pair of flat, parallel facing webs and an intermediate web between the facing webs and having means to facilitate folding of the section to form the walls of the carton;

the intermediate web being comprised of first and second groups of members having substantially planar sections interconnected with each other and extending between and interconnected to the facing webs and the planar sections of one group being angularly oriented to the planar sections of the other group, the facing webs and the groups providing means to resist bending of the wall section respectively along a first axis parallel to the plane of the wall section and along a second axis also parallel to the plane of the wall section and oriented at an angle to the first axis; and

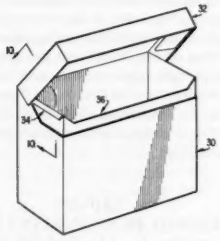
the flap section being comprised of extensions of the facing webs and an extension of one of said groups therebetween and the other of said groups being confined within the area of the wall section and the flap section having slits dividing the section into four flaps and also having means to facilitate folding of the flaps to form the bottom of the carton.

3,910,486

RECLOSABLE CONTAINER AND BLANKS THEREFOR

Orison W. Stone, Rt. 17, New Haven, Vt. 05472

Filed Apr. 5, 1974, Ser. No. 458,188
Int. Cl.[2] B65D *5/54*; **S65D** *17/00*
U.S. Cl. 229—51 TC **10 Claims**



1. A paperboard blank for a paperboard container comprising:

a front panel which includes a detachable portion and an attachment flap integrally connected to said detachable portion at the upper extremity of said front panel;

a pair of side panels, each side panel being integrally connected to said front panel and including a detachable tab in the upper portion thereof, the upper portion of one of said side panels including a fixed latching tab removably connected to the detachable tabs of that side panel;

a collar panel disposed adjacent said attachment flap and the upper portion of both of said side panels, said collar being integrally connected to the upper portion of both of said side panels and to said fixed latching tab;

a bottom panel integrally connected to said front panel;

a back panel integrally connected to said bottom panel; and,

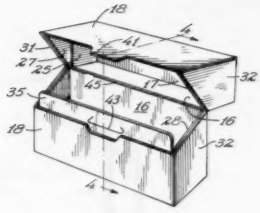
a top panel integrally connected to said back panel, said top panel having at least one integrally connected side flap adapted for attachment to one of said detachable tabs when said top panel is disposed in an overlying relationship with said attachment flap for attachment thereto.

3,910,487

RECLOSABLE CARTON

Harold R. Jaeschke, Milwaukee, Wis., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed June 19, 1974, Ser. No. 480,837
Int. Cl.[2] B65D *5/54*
U.S. Cl. 229—51 TC **3 Claims**



1. A blank made from foldable paperboard or similar sheet-like material adapted to be erected into a sealed carton, which, when opened, has a reclosable hinged top cover, comprising:

a substantially rectangular sheet of said material having opposed top, bottom and lateral edges;

three parallel fold lines spaced intermediate the two lateral edges of said sheet, said parallel fold lines defining four panels;

said four panels including a bottom panel located at a first of said lateral edges of said sheet, an adjoining back panel, a top panel adjoining said back panel, and a front panel adjoining said top panel and located at the second lateral edge of said sheet from said bottom panel;

closure flaps hingedly attached to the top and bottom edges of each of said panels;

a perforated line extending from top to bottom across said front panel and said closure flaps attached to said front panel, said perforated line spaced from said second lateral edge of said sheet a predetermined distance, and said perforated line being formed in part in a U-shape to form an insertable reclosure tab;

said perforated lines in said front panel closure flaps being oriented at predetermined angles in a direction away from said second lateral edge of said sheet from the ends of said perforated line in said front panel at the top and bottom edges thereof; and

perforated lines in said back panel closure flaps aligned parallel to said perforated lines in said front panel closure flaps, extending from the ends of said back panel fold line at the top and bottom edges of said back panel;

a glue flap hingedly attached to said bottom panel along said first lateral edge;

said glue flap having a line-cut formed therein and spaced from said first lateral edge a length equal to said predetermined distance spacing of said perforated line in said front panel, said cut line adapted to receive said reclosure tab; and

a fold line extending from top to bottom in said back panel adapted to become a hinge for rotating said reclosable top cover after said carton is opened.

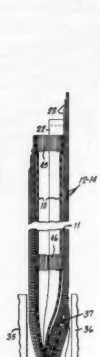
3,910,488
GUSSETED PINCH BOTTOM BREAKAWAY POUCH BAG

John J. Goodrich, Pensacola, Fla., assignor to St. Regis Paper Company, New York, N.Y.

Continuation-in-part of Ser. No. 235,908, March 20, 1972, Pat. No. 3,807,626. This application Apr. 12, 1974, Ser. No. 460,497The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.

Int. Cl.[2] B65D *33/02*

U.S. Cl. 229—55 5 Claims



1. A bag of tubular form open at one end and closed at the other end, comprising a plurality of contiguous plies of flexible sheet material bonded together adjacent each of said ends, and an innermost ply of heat sealable plastic material lightly bonded adjacent said bag ends to the contiguous paper ply for manual detachment therefrom, said bag being longitudinally and reversely creased along diametrically opposed portions to provide a pair of oppositely disposed gussets interposed between front and rear wall portions, at least some of the inner plies being stepped progressively upward with respect to the outer ply in the front wall portion at the open bag end, at least the outermost ply being stepped upwardly with respect to the innermost ply in the rear wall portion at the open bag end to provide an exposed overlap rear wall portion with respect to the innermost ply of said front wall portion, at least portions of said gussets extending above said front wall portion at said open bag end and terminating within said overlap rear wall portion to provide exposed portions of said gussets, said overlap rear wall and exposed gusset portions being coated with a reactivatable adhesive at said open bag end, the bag construction at said closed end being the reverse of that at the open end, said plastic ply being heat sealed to closure adjacent said closed end, the exposed overlapping rear wall portion and exposed gusset portions thereat being folded over with said heat sealed end of said plastic ply and sealed to closure against the opposite wall portion, said bonding together of said paper plies at said end thereby imparting to said closure the combined strength of all such plies, the open end of said bag being adapted for heat sealing of said plastic ply and closure similarly to that of said closed end and said bag when so closed at both ends being sift and leak proof, and resistant to insect penetration and being adapted for opening of said paper plies and removal of said plastic ply intact.

3,910,489
CENTRIFUGE

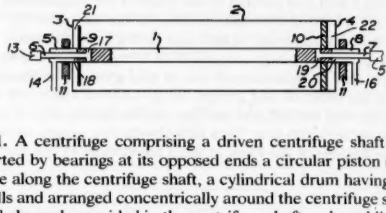
Bengt Uden, Raa, Sweden, assignor to AS Pellerin/Zenith, Helsingborg, Sweden

Filed Feb. 12, 1974, Ser. No. 441,866

Claims priority, application Sweden, Feb. 13, 1973, 7301988

Int. Cl.[2] B04B *11/04*

U.S. Cl. 233—3 6 Claims



1. A centrifuge comprising a driven centrifuge shaft supported by bearings at its opposed ends a circular piston movable along the centrifuge shaft, a cylindrical drum having end walls and arranged concentrically around the centrifuge shaft, and channels provided in the centrifuge shaft and establishing communication between the interior of the centrifuge and inlet and oulet conduits at the two ends of the centrifuge shaft, said conduits being adapted to supply untreated feedstock and to discharge treated material, respectively, wherein the channels comprise two pairs of channels the mouths of which in the interior of the centrifuge are spaced apart longitudinally of the centrifuge shaft, the mouths of one pair of channels lying at one end of the centrifuge and the mouths of the other pair of channels lying at the other end of the centrifuge; and the centrifuge includes at least one stationary disc which is located between the mouths of the one pair of channels and extends at right angles to the centrifuge shaft and has a radius smaller than that of the drum; and the circular piston is disposed around at right angles to the centrifuge shaft and has a radius substantially equal to that of the drum, the piston being movable along the centrifuge shaft from an extreme position at one end of the centrifuge to an extreme position at the other end of the centrifuge.

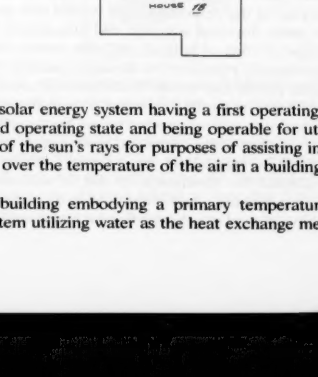
3,910,490
SOLAR ENERGY HEAT AND COOLING SYSTEM

William E. Saypalia, Jr., 143 Rockville Rd., Broad Brook, Conn. 06016

Filed Mar. 21, 1974, Ser. No. 453,400

Int. Cl.[2] F24J *3/02*

U.S. Cl. 237—1 A 7 Claims



1. A solar energy system having a first operating state and a second operating state and being operable for utilizing the energy of the sun's rays for purposes of assisting in effecting control over the temperature of the air in a building comprising:

a. a building embodying a primary temperature control system utilizing water as the heat exchange medium;

b. an enclosure located externally of said building, said enclosure including a multiplicity of removable side walls and a roof, at least one of said multiplicity of side walls being oriented so as to have the major surface thereof facing in a southerly direction, said multiplicity of side walls being joined together and to said roof when the solar energy system is in the first operating state thereof and said multiplicity of side walls being removed when the solar energy system is in the second operating state thereof thereby permitting in the second operating state thereof the free flow of air into said enclosure, said multiplicity of side walls and said roof each being formed of a transparent material operable to permit the sun's rays to pass therethrough;

c. a swimming pool containing water located within said multiplicity of side walls of said enclosure so as to be exposed to the sun's rays;

d. a collector mounted within said multiplicity of side walls of said enclosure so as to have at least one of the major surfaces thereof facing in a southerly direction, said collector comprising a closed structure operable to provide a fluid flow passage therethrough for water, said collector being formed of a transparent material operable to permit the sun's rays to pass therethrough;

e. an aluminum foil reflector supported within said multiplicity of side walls of said enclosure in parallel spaced relation to said one of said multiplicity of side walls and so as to be exposed to the sun's rays;

f. first conduit means operable to provide a closed fluid flow path for water between said swimming pool and said collector, said first conduit means including first pipe means, filter and pump means, second pipe means and third pipe means, said first pipe means having one end thereof connected in fluid flow relation with said swimming pool and the other end thereof connected in fluid flow relation with one side of said filter and pump means, said second pipe means having one end thereof connected in fluid flow relation with the other side of said filter and pump means and the other end thereof connected in fluid flow relation with one end of the fluid flow passage in said collector, said third pipe means having one end thereof connected in fluid flow relation with the other end of the fluid flow passage in said collector and the other end thereof connected in fluid flow relation with said swimming pool; and

g. second conduit means operable to provide a closed fluid flow path for water between said swimming pool and said primary temperature control system in said building, said second conduit means comprising a pair of pipe means and a pair of valve means operable for controlling the flow of water through said pair of pipe means, one of said pair of pipe means and one of said pair of valve means being connected in series fluid flow relation with each other and having one end thereof connected in fluid flow relation with said swimming pool and the other end thereof connected in fluid flow relation with said primary temperature control system, the other of said pair of pipe means and the other of said pair of valve means being connected in series fluid flow relation with each other and having one end thereof connected in fluid flow relation with said swimming pool and the other end thereof connected in fluid flow relation with said primary temperature control system.

3,910,491

ICE AND SNOW GRIP FOR VEHICLES

Jean-Louis Ducharme, 6007 Lafontaine, Montreal 24, Quebec, Canada

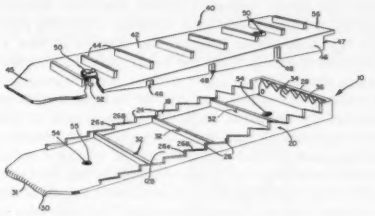
Filed May 29, 1974, Ser. No. 474,204
Claims priority, application Canada, May 23, 1974, 200844
Int. Cl.[2] E01B *23/00*
U.S. Cl. 238—14 **10 Claims**

1. An ice and snow grip for a tire on a motor vehicle, comprising:

an elongated body including an inclined ramp portion, a nose portion at the lower end of said ramp portion for insertion under said tire and two parallel sidewalls downwardly extending at opposite sides of said ramp portion and tapering to said nose portion,

said ramp portion having tire-receiving upper face and an under face,

a first series of transverse tire-gripping projections spaced longitudinally along said upper face,



a series of ground-engaging teeth defined longitudinally along the lower edge of each said sidewall,

a second series of transverse projections spaced longitudinally along said under face for further gripping in snow and ice, and

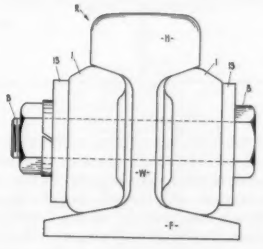
a slide movably mounted to an end wall opposite to said nose portion, a series of teeth being provided at the lower edge of said slide for further gripping action in snow and ice.

3,910,492

INSULATED RAIL JOINTS

Kenneth Stanley Sinfield, Strathfield West, Australia, assignor to National Springs Pty Limited, Alexandria, Australia

Filed Oct. 4, 1973, Ser. No. 403,623
Claims priority, application Australia, Oct. 10, 1972, 783/72
Int. Cl.[2] E01B *11/10*
U.S. Cl. 238—243 **1 Claim**



1. A rail joint bar moulded as a solid component from a reinforced dielectric material, said bar being moulded to finished cross-sectional profile shape and overall dimensions and having a plurality of longitudinally spaced bolt holes formed therethrough, said bar being moulded from a thermo-

setting, glass filament reinforced material having strands of the glass filament reinforcement running longitudinally of the bar and disposed in random spacing throughout the bar cross-section, said bar including top and bottom surfaces adapted to respectively engage the under surface of a rail head and the upper surface of the rail flange when mounted upon the rail and being dimensioned to tighten in a wedging action against said rail surfaces when bolted to the rail, the cross-sectional profile of the bar comprising a flat, vertical outer surface blended by upper and lower radiussed corners into top and bottom surfaces, the top surface extending upwardly inwardly from the upper radiussed corner and then downwardly inwardly and the downwardly inwardly extending part engages the rail head under surface; the bottom surface extending upwardly inwardly from the lower radiussed corner and engaging the rail flange upper surface; the downwardly inwardly extending top surface part and the bottom surface part being blended by radiussed projections into a pair of flat vertical inner surfaces set back from the projections towards the outer surface and located on each side of a center inner vertical surface extending to the full width of the bar, said center inner vertical surface being located in a center region of the bar and including regions surrounding those said bolt holes located in this region, a pair of steel plates bonded to the vertical outer surface of the bar and separated longitudinally from each other in said center region of the bar, said steel plates having bolt holes formed therethrough in register with the bolt holes in the bar; the lower radiussed corner of the bar being chamfered at each end region of the bar beneath the respective steel plates.

3,910,493

RAILWAY RAIL-FASTENING MEMBER AND A RAILWAY RAIL AND FASTENING ASSEMBLY EMPLOYING IT

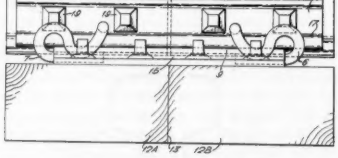
Thomas William Wood, Laxton, England, assignor to Pandrol Limited, London, England

Filed June 4, 1974, Ser. No. 476,263

Claims priority, application United Kingdom, June 6, 1973, 27091/73

Int. Cl.[2] E01B *9/30*

U.S. Cl. 238—349 **11 Claims**



1. A railway rail-fastening member comprising a length of resilient metal of rod form which is bent so as to have, progressing from one end of the length of metal to the other, a first portion in the form of a substantially straight leg, then a second portion, then a third portion, then a fourth portion and then a fifth portion, these portions being such that it is possible for the rail-fastening member to be so placed that the first portion is horizontal and when the rail-fastening member is viewed from above the third and fifth portions appear to be on opposite sides of the axis of the first portion, the fourth portion crosses and lies above a part of the axis of the first portion which is nearer to said one end of the length of metal than it is to the opposite end of the straight leg and the fifth portion appears to be substantially perpendicular to said axis, this portion constituting said other end of the length of metal.

3,910,494

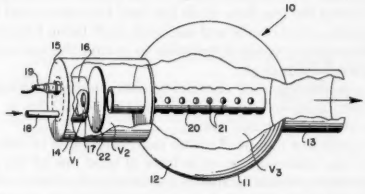
VALVELESS COMBUSTION APPARATUS

Rosser B. Melton, Jr., Helotes, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Feb. 21, 1974, Ser. No. 444,403

Int. Cl.[2] B05B *1/24*, *17/04*; **F23R** *1/00*

U.S. Cl. 239—13 **25 Claims**



1. A combustion apparatus for generating and directing a high pressure blast of gas comprising, in combination:

a housing;

a first chamber in said housing having a fuel-air mixture inlet;

a second chamber in said housing in communication with and adjacent said first chamber at one end, said second chamber being open at its other end to the atmosphere to form a discharge outlet for said housing;

means for igniting said fuel-air mixture in said first chamber; and

means extending from said first chamber into said second chamber to distribute ignited fuel-air mixture from said first chamber into said second chamber to cause combustion of a fuel-air mixture in said second chamber.

3,910,495

DISPENSING CONTAINER FOR SOLID AIR-TREATING GEL

Jerry D. Cummings, Garwood, and John M. Paulovich, Carlstadt, both of N.J., assignors to Airwick Industries, Inc., Teterboro, N.J.

Filed Apr. 24, 1974, Ser. No. 463,827

Int. Cl.[2] A61L *09/04*

U.S. Cl. 239—58 **24 Claims**

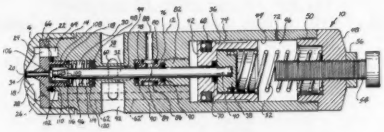
1. A dispensing container for air-treating gel comprising, a base member in the form of a cup having an open upper end portion and integral base and side walls, said cup including internal guide and support means comprising a plurality of axially elongated and peripherally spaced spring fingers ex-

tending upwardly therefrom to positions above the upper end portion of said base; and a closure member for said dispenser comprising an elongated cup having opposed closed and open end portions and a side wall extending therebetween, said cover receiving and slidably engaging said spring fingers through its open end portion in a friction fit with the inner surface of its sidewall engaging said fingers whereby said elongated closure member is adapted to be supported on said spring fingers above the open end of said base member.

3,910,496
ATOMIZER

Donald A. Gallant, Charlotte, N.C., assignor to Longwood Machine Works, Incorporated, Woodside, N.Y.

Filed Jan. 11, 1974, Ser. No. 432,746
Int. Cl.² B05B *15/02*; **F23D** *11/34*, *13/28*
U.S. Cl. 239—118 **21 Claims**



1. An atomizer comprising a body portion having a liquid discharge nozzle at the front end thereof and a liquid flow chamber connected to said nozzle, a cleaning rod reciprocably disposed in said liquid flow chamber in alignment with said liquid discharge nozzle, valve means including a movable valve component formed on said rod at a rearward spacing from said forward end thereof and a stationary valve component disposed in said body portion, means for reciprocating said rod and selectively retaining it in a rearward operative position wherein the forward end thereof is spaced from said nozzle and said valve components are disposed in spaced open valve position and a forward inoperative position wherein said forward end thereof is disposed within said nozzle and said valve components are in valve closing engagement, said movable valve component extending axially along said rod sufficiently to maintain valve closing engagement of the valve components during a portion of axial movement of said rod, means for supplying liquid to said liquid flow chamber through said valve means, and means for discharging air under pressure from said body portion at said nozzle to aspirate liquid from said flow chamber and atomize the liquid as it leaves said nozzle.

3,910,497
HYDRAULIC VALVE OPERATOR AND REMOTE CONTROL

Paul A. Manor, Lima, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 194,320, Nov. 1, 1971, abandoned. This application July 20, 1973, Ser. No. 381,079
Int. Cl.² B05B *9/00*
U.S. Cl. 239—127 **8 Claims**

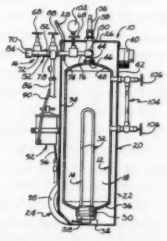
1. In a system for controlling the flow of water from a pump connected to a reservoir to a hose having a discharge nozzle, a valve having a body containing movable piston means, means whereby said piston means is exposed at one end to water at pump pressure, means defining an actuator chamber at the other end of said piston means, means providing hydraulic pressure distinct from said pump pressure in said actuator chamber, means providing spaced ports in said body connected to said hose and a bypass to said reservoir respectively, had a valve element in said body connected to said piston means so that when there is effective hydraulic pressure in said chamber the piston means is displaced in one direction to dispose said valve element to close the bypass port and permit water to be pumped through said hose and when there is no effective hydraulic pressure in said chamber water under pump pressure is operative to oppositely displace said piston means to dispose said valve element to close the port leading to the hose while permitting bypass of water from the pump to the reservoir.

7. A machine for cleaning sewer or like pipes and including a hose wound on a rotatable reel and having a discharge nozzle at its free end and water conduit means connecting the other end of said hose through a water pump to a water reservoir on the machine, said machine being mounted on a mobile support adapted to be located near an access opening through which said hose may be extended to dispose the nozzle in cleaning relation relative to said pipes, characterized by a first means for controlling the direction of rotation of the reel comprising a hydraulic motor for rotating said reel, a hydraulic pump providing a cource of hydraulic fluid under pressure, hydraulic fluid conduit means between said hydraulic pump and motor and a solenoid valve in said conduit means, a second means including a water valve in said water conduit, hydraulic actuator means operated by a second solenoid operated valve for controlling flow of water from the water pump to the hose, and a remote control unit for control of said solenoid valves at a point spaced from said support disposed in spaced relation to said discharge nozzle and adapted to be normally stored on said support independently of hose movement in spaced relation to said hose and being connected to said support by flexible cable means, said unit being electrically connected to both of said solenoid valves through said cable means and having switch devices connected for selectively reversibly actuating each of said solenoid valves.

3,910,498
STEAM GENERATOR

Taylor H. Harrison, Kansas City, Mo., assignor to Frank Harrison, Kansas City, Mo.

Filed Dec. 13, 1974, Ser. No. 532,361
Int. Cl.² B05B *1/24*
U.S. Cl. 239—137 **8 Claims**



1. A cleaning apparatus for automobile radiators and the like, said apparatus comprising:

a pressure tank;

means for selectively introducing a quantity of water into said tank;

means for heating said quantity of water in said tank to a sufficient degree to create a supply of steam therein;

a conduit assembly in communication with the interior of said tank for receiving steam generated therein and discharging the steam at a point of usage;

an air line interconnecting said conduit assembly in flow communication with a source of pressurized air, said air line being coupled with said conduit assembly at a juncture intermediate an inlet end and an outlet end thereof; a first control valve interposed in said conduit assembly upstream from said juncture for selectively controlling the discharge of steam from said tank; and

an airflow control device interposed in said air line for selectively controlling the introduction of pressurized air into said conduit assembly whereby either steam or pressurized air or a combination of steam and air may be discharged from said conduit assembly at a point of usage.

3,910,499

SMALL-SIZED DISHWASHING MACHINE

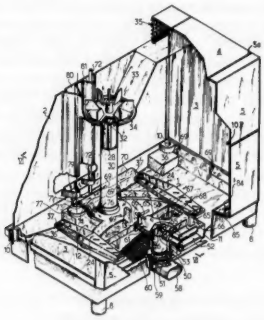
Maurice Marie Achille Trouilhet, Lyon, France, assignor to Seb S.A., Selongey, France

Filed Mar. 4, 1974, Ser. No. 447,995

Claims priority, application France, Mar. 15, 1973, 73.09375; Nov. 8, 1973, 73.39734

Int. Cl.[2] **A47L** *15/06, 15/23*

U.S. Cl. 239—228 **19 Claims**



1. A small-sized dishwashing machine comprising in combination: a tank forming a casing containing articles to be washed and adapted to be supplied with water, said tank having a top wall and a recess on the outside of said top wall, a bottom wall and bosses inwardly projecting therefrom, two lateral walls, a front wall and a rear wall; a pump body resting upon said bottom wall of the tank and immersed in the water; a motor located in said recess of the top wall, a small vane turbine-wheel enclosed in said pump body, a shaft connected to said motor located in said recess of the top wall and to said turbine wheel for driving said turbine wheel in rotation; two channels on said pump body extending symmetrically with respect to the axis of the turbine wheel to ensure a symmetrical flow of the water sucked by the turbine-wheel, said pump body comprising two moulded plastic plates, namely a first plate resting upon said bottom wall through the medium of said bosses of the bottom wall and provided with an impression forming a housing for said turbine, the said two channels communicating with and starting from said impression and extending therefrom in the shape of arcs of circles, and a second plate forming a cover for said impression and said channels; a protective sleeve surrounding said shaft and serving as a spacer between said top wall of the machine and said pump body in order to maintain the latter applied on said bosses of said bottom wall of the tank; and two revolving sprinklers mounted on said second plate at the end of each channel respectively, for thus allowing a uniform and balanced rotation of said turbine-wheel drive shaft with minimum wear.

3,910,500

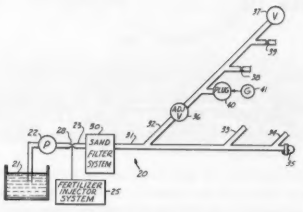
DRIP IRRIGATION SYSTEM AND COMPONENTS THEREOF

Artson P. Hardison, Glendora, Calif., assignor to Xeros Controls, Azusa, Calif.

Filed Sept. 28, 1973, Ser. No. 401,804

Int. Cl.[2] **A62C** *5/02;* **B05B** *7/26, 15/00*

U.S. Cl. 239—310 **35 Claims**



1. A drip irrigation system comprising in combination: an inlet conduit to receive a supply of water to be distributed; a sand filter system comprising at least two sand filters, each having an inlet and an outlet; a manifold connected to and receiving filtered water from said outlets, the inlet conduit being connected to the said inlets, the inlets and outlets being connected in parallel through the respective sand filters, the inlets being connected to each other, and the outlets being connected to each other; valving means connected to each of said sand filters so disposed and arranged as selectively to connect or to disconnect the inlet conduit to or from each inlet, and selectively to connect or to disconnect the respective inlet to a flushing outlet; a plurality of distribution conduits connected to and receiving water from said manifold; and at least one emitter connected to each distribution conduit for emitting water therefrom.

3,910,501

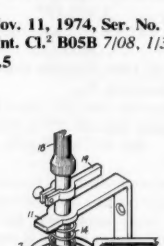
ATOMIZER

Murray Gene Tyrone, 906 Santa Ana Drive, Santa Rosa, Calif. 95404

Filed Nov. 11, 1974, Ser. No. 522,615

Int. Cl.[2] **B05B** *7/08, 1/30*

U.S. Cl. 239—417.5 **7 Claims**



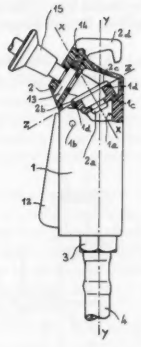
1. In an atomizer device,

a pair of hollow elements,
complemental substantially helical meeting edges of said elements,
shoulders on said complemental helical edges defining at least one nozzle orifice for atomizing,
means to hold said elements together so that at least one element is movable relative to the other about an axis corresponding to the axis of said helical edges,
said elements forming a chamber at least in the vicinity of said meeting edges,
and means to convey a medium into said chamber for discharge through said nozzle orifice.

3,910,502
COMPRESSED AIR GUN

Claude Mermillod, Faverges, France, assignor to Ste Anonyme des Ets Staubli, Faverges, France

Filed Aug. 23, 1974, Ser. No. 500,183
Claims priority, application France, Sept. 6, 1973, 73.32700
Int. Cl.² B05B *15/08;* **F16L** *27/00, 37/02*
U.S. Cl. 239—531 **5 Claims**

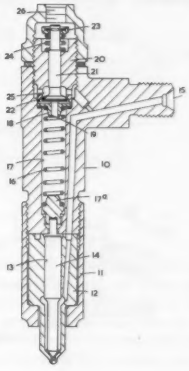


1. A compressed air gun for attachment to an air supply line, comprising:
a body member elongated in the direction of its axis and having a bore extending through the body member and having means for connecting the air supply line with the bore, said body member having an end wall whose external surface lies in a plane disposed at an oblique angle to said axis;
an air blowing nozzle; and
a nozzle support member having a bore extending therethrough in the direction of the axis of the support member and having means to receive and support the nozzle in communication with one end of its bore; and the support member having at the other end of its bore an end wall whose external surface lies in a plane disposed at an oblique angle to the axis of the support member;
the central portions of the surfaces of the end walls of said members being provided with mating hollow boss and socket pivot members extending perpendicularly through the central portions of the end walls at which they are respectively located and communicating respectively with the bores of the body and support members, the surfaces around said pivot members lying in contact with each other when the pivot members are mated; and
means for maintaining the pivot members mated.

3,910,503
FUEL INJECTION NOZZLES

Stanley Frederick Barber, Pinner, England, assignor to C.A.V. Limited, Birmingham, England

Filed May 2, 1974, Ser. No. 466,231
Claims priority, application United Kingdom, May 12, 1973, 22718/73
Int. Cl.² B05B *1/30;* **F02M** *47/02*
U.S. Cl. 239—533 **10 Claims**

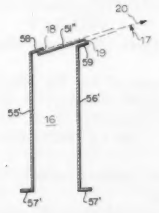


1. In a fuel injection nozzle including a body having a fuel inlet and an outlet, an injection valve element movable in the body to control flow through the outlet, spring means biasing said valve element toward a closed position with respect to said outlet, said valve element having a pressure-actuating surface portion facing the outlet and exposed to inlet pressure whereby inlet pressure is effective to counter the closing effect of said spring means, and means including a pressure-reducing valve responsive to inlet pressure and acting on the injection valve element in a closing direction to augment the closing bias of the spring means.

3,910,504
AIR JET NOZZLE ASSEMBLY

Joseph W. Laird, Lubbock, Tex., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 4, 1974, Ser. No. 476,191
Int. Cl.² B05B *1/26*
U.S. Cl. 239—543 **9 Claims**



1. An air jet nozzle assembly comprising a plurality of air jet nozzles having spaces therebetween, each nozzle comprising an air plenum having ends and both upper and lower longitudinal sections, as well as means for securing said sections together and means for securing said secured sections to said ends; means comprising two parallel slots in the upper section which communicate with said plenum for producing converg-

ing air jets; and means for pivoting said nozzles about an axis parallel to the slots.

3,910,505

METHOD OF PRODUCING FIBER PULP FROM VEGETABLE OF FIBROUS MATERIAL

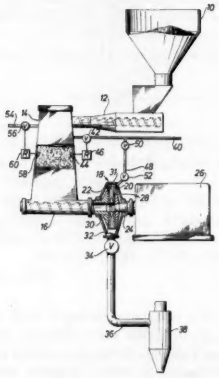
Rolf Bertil Reinhall, 16 Killingevagen, S-181 64 Lidingo, Sweden

Filed Apr. 11, 1974, Ser. No. 459,899

Claims priority, application Sweden, Apr. 27, 1973, 7306030

Int. Cl.[2] B02C *23/40*

U.S. Cl. 241—18 **5 Claims**



1. In a method for producing fiber pulp from fibrous vegetable material wherein the fibrous material is preheated in a closed receptacle by means of steam and thereafter ground between grinding discs under superatmospheric pressure in a grinding apparatus casing communicating with the closed receptacle, the improvement comprising the step of supplying a gas other than steam to the closed receptacle at a pressure and temperature so as to maintain the total pressure in the preheater receptacle greater than the pressure in the grinding casing without increasing the temperature in the receptacle above that temperature prevailing therein due to the preheating by steam.

3,910,506

PROCESS AND APPARATUS FOR CRUSHING HARD OR ABRASIVE MATERIALS UNDER HIGH PRESSURE WITHOUT CONTAMINATION OF THE GROUND PRODUCT

Carlos Romeu Y Pecci, Historiador Diago No. 14, Valencia, Spain

Continuation-in-part of Ser. No. 305,876, Nov. 13, 1972, abandoned. This application Apr. 30, 1974, Ser. No. 465,701

Claims priority, application Spain, Nov. 11, 1971, 396921

Int. Cl.[2] B02C *4/32*

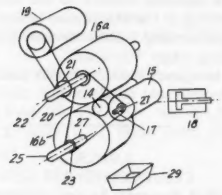
U.S. Cl. 241—29 **16 Claims**

12. A process for crushing particles of hard material comprising the steps of:

providing two parallel vertically spaced apart secondary rollers and a primary roller disposed adjacent the space between the secondary rollers and contacting both of them; forcing the primary roller simultaneously against both secondary rollers; rotating the primary roller in a direction which moves material between the primary and upper secondary roller; rotating the secondary rollers in the opposite direction;

feeding material to be crushed at a predetermined flow rate to a location from which it can move between the upper secondary and primary rollers; crushing that material between the upper secondary and primary rollers;

throwing the crushed material off the primary roller after the material to be crushed has moved between the upper



secondary and primary rollers; causing the crushed material to fall between the primary and lower secondary rollers and crushing this material a second time between the latter rollers.

3,910,507

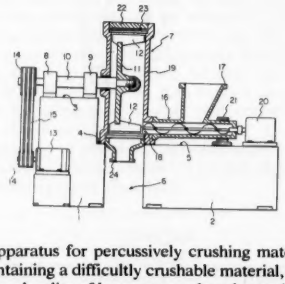
CRUSHER

Nobuhiko Okada, Nara, and Teruaki Suzuki, Kadoma, both of Japan, assignors to Osaka Gas Kabushiki Kaisha and Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho, both of Osaka, Japan

Filed Oct. 9, 1973, Ser. No. 404,755

Int. Cl.[2] B02C *13/09, 13/286*

U.S. Cl. 241—73 **14 Claims**



1. An apparatus for percussively crushing materials to be treated containing a difficultly crushable material, comprising a housing, a plurality of hammer members located within said housing, said hammer members being adapted to be rotated around a substantially horizontal axis and to impart percussive forces to said mixture by the rotation thereof, drive means for rotating said hammer members, means for feeding said materials into said housing, first conduit means whereby of said materials to be treated, the one crushed by the hammer members is withdrawn from the housing, second conduit means for withdrawing said difficultly crushable material from the housing, a liner member extending substantially along the path of rotation of the tips of the hammer members, said liner member having an uneven surface substantially parallel with the axis of rotation of said hammer members and opposed to said path of rotation, means defining openings communicating with the inlet of said first conduit means, said openings being adapted to permit the passage of only said crushed material therethrough, the outlet of said feeding means and the inlet of said second conduit means being located at a position corresponding to the lower end of said path of rotation, the inlet of said second conduit means being substantially adjacent to the rear side of the outlet of said feeding means as viewed in the direction of rotation of said hammer members, said liner member being opposed to substantially all said path of rotation except for the area where the inlet of said second conduit

means and the means defining said openings are opposed to said path of rotation.

3,910,508

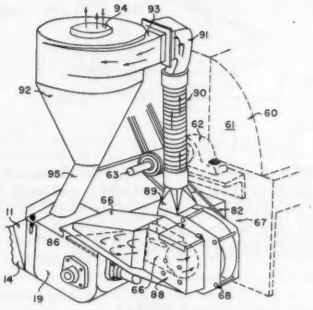
MIXING APPARATUS FOR FLUENT MATERIAL

Ammon W. Stauffer, Terre Hill, and Robert W. Lowry, New Holland, both of Pa., assignors to A.W. Stauffer and Sons, Inc. and Portable Mills, Inc., both of Terre Hill, Pa.

Filed Dec. 26, 1972, Ser. No. 318,333

Int. Cl.[2] B02C *9/00*

U.S. Cl. 241—101 B **3 Claims**



1. Portable mixing apparatus adapted to be mounted on a vehicle for grinding and mixing fluent material, said apparatus including means for grinding fluent material with an outlet below said grinding means, a duct for transporting said fluent material communicating with said outlet at a first end of said duct, fan means,

a second duct mounted at right angles to and communicating with said duct at a second end thereof for transporting said fluent material to a mixing means,

a third duct extending between said second end of said duct and said fan means to provide a draft created by said fan means for drawing fluent material from said grinding means to said duct, and

baffle means located in said duct adjacent to said second end for seperating said fluent material into a heavier portion which travels below said baffle means into said second duct and a lighter portion which travels above said baffle means into said third duct.

3,910,509

MILL WHICH OPERATES AT AN OVERCRITICAL SPEED OF ROTATION

Wilhelm Eirich, Hardheim, Germany, assignor to Maschinenfabrik Gustav Eirich, Hardheim, Germany

Filed Mar. 11, 1974, Ser. No. 450,239

Claims priority, application Switzerland, Mar. 14, 1973, 3732/73

Int. Cl.[2] B02C *15/02*

U.S. Cl. 241—120 **18 Claims**

1. A mill comprising

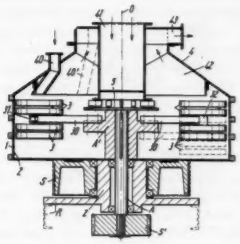
a. a grinding container arranged to contain material to be ground and having an axis therein about which the container is drivably rotatable at an overcritical speed of rotation and an internal cylindrical material grinding face,

b. a grinding member carrier positioned within the grinding container and rotatable therein at an overcritical speed,

c. a plurality of trailing arms pivotally mounted on said carrier within said container and extending from the point of pivotal attachment in a direction opposite to the rotational direction of said carrier,

d. grinding members rotatably mounted on said trailing arms within said container inwardly from said grinding face at a position on said trailing arms spaced from the point of pivotal attachment to said carrier,

e. means for controlling the difference between the peripheral speed of rotation of the grinding members and the speed of rotation of the grinding face of said grinding container, so that the grinding members are forced outwardly by centrifugal force to roll over the material to be



ground which is distributed within the container over the material grinding face by centrifugal force of said container, and the normal speeds of rotation of the grinding container and the grinding members are in a range in which the centrifugal forces in the region of the material to be ground and at the grinding member are a multiple of their weight.

3,910,510

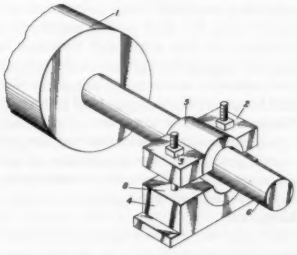
SOLID WASTE CHOPPER OF ROTARY TYPE

Victor Danberg, 6 Mary Ann Lane, Wallingford, Conn. 06492

Continuation-in-part of Ser. No. 207,067, Dec. 13, 1971, abandoned. This application Apr. 17, 1974, Ser. No. 461,585

Int. Cl.[2] B02C *18/18*

U.S. Cl. 241—189 R **9 Claims**

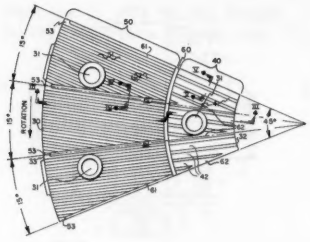


1. Cutting apparatus including a frame having mounted thereon a rotor to which is attached at least one rotor knife, at least one bed knife mounted on said frame and positioned in cooperative cutting relation with said rotor knife, said rotor including a shaft journalled for rotation of less than 700 R.P.M., journal means holding said shaft in a substantially fixed horizontal position, while constructed to permit vertical movements of said rotor and shaft during rotation thereof, and stop means limiting said vertical movements of said rotor and shaft, such that upon encountering a predetermined resistance to cutting, said rotor is free to rise to a new cutting position with a different cutting angle with respect to said bed knife, whereby tough materials which resist cutting action are given cutting action at a different cutting angle, assisted in force by the weight of said rotor in returning to a normal lower position.

3,910,511
OPEN DISCHARGE PULP REFINER

Philip J. Leider, Millboro, and Jorg Rihs, Clifton Forge, both of Va., assignors to Westvaco Corporation, New York, N.Y.

Filed May 20, 1974, Ser. No. 471,473
Int. Cl.[2] B02C *7/06, 7/12*
U.S. Cl. 241—261.3 **12 Claims**



1. In an open discharge, low consistency, cellulosic stock refining engine having an unpressurized stock discharge conduit and a cooperative pair of planar, oppositely facing, relatively rotating refining plates, said plates having a circular outer periphery about an axis of rotation and being divided into inner and outer concentric annular sections, said annular sections being separated by a circular distribution groove into the face plane of said plates, said outer annular section being further divided into a plurality of circle sectors, said sectors being separated by stock feed grooves into the face plane of said plates, said stock feed grooves extending linearly from said circular distribution groove to the proximity of said outer periphery, relative to a predetermined rotational direction for said plates, the improvement comprising:

A. a plurality of alternating parallel beater bars and flow channels extending across the face plane of said plates within a sector which is delineated by two angularly successive feed grooves relative to said rotational direction, the feed groove angularly leading said sector relative to said rotational direction being designated as the leading feed groove and the feed groove angularly trailing said sector relative to said rotational direction being designated as the lagging feed groove, said bars and channels within a respective sector being angularly oriented parallel to the length of said lagging feed groove, a number of said channels within a respective sector being continuously open from said circular distribution groove to said outer plate periphery, the remainder of said channels within a respective sector being continuously open from the respective leading feed groove to said outer plate periphery; and,

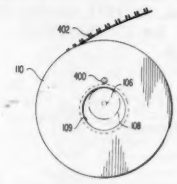
B. said feed grooves terminating inwardly from said outer periphery thereof respective to at least one plate of a cooperative pair.

3,910,512
CONNECTOR PLATE COIL SUPPORT

John Calvin Jureit, Coral Gables; Roy Leutwyler, Miami; Larry Brodsky, Sunrise; Benjamin Kushner, and Adolfo Castillo, both of Miami, all of Fla., assignors to Automated Building Components, Inc., Miami, Fla.

Division of Ser. No. 317,095, Dec. 20, 1972, abandoned. This application Apr. 19, 1974, Ser. No. 462,444
Int. Cl. B65h *75/28*
U.S. Cl. 242—1 **7 Claims**

1. An industrial product comprising a reel having a hub and support structure disposed adjacent one end of said hub and extending radially outwardly therefrom, an elongated strip of sheet metal connector stock coiled about said hub and supported endwise at one end by said support structure, said connector stock strip having a plurality of elongated nail-like teeth struck integrally therefrom to form a plurality in excess of two of longitudinally extending laterally spaced rows of teeth substantially uniformly distributed throughout the extent of said coiled connector strip and leaving a plurality in excess

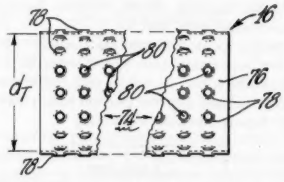


of two of longitudinally extending laterally spaced rows of slots in said sheet metal strip from which said teeth are struck, with the tips of the teeth in at least intermediate windings of said colied strip bearing against the sheet metal stock in the next adjacent winding of said coiled strip.

3,910,513
COLLECTION TUBES FOR ROTARY COLLECTION OF FILAMENTARY MATERIAL

Robert J. Gelin; David V. Stotler, both of Newark, Ohio, and John W. Daugherty, Northville, Mich., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 18, 1973, Ser. No. 407,756
Int. Cl.[2] B65H *54/02, 75/26, 75/10*
U.S. Cl. 242—18 G **9 Claims**



7. An apparatus for collecting filamentary material into a wound package comprising:

a. a rotatable, expandable collet;

b. a stretchable tubular sleeve on the collet, the sleeve having an unstretched inside diameter which is larger than the outside diameter of the unexpanded collet and having projections which are spaced axially and circumferentially one from another on the exterior of the tubular sleeve, each of the projections defining an aperture in its central region passing through the sleeve;

c. means for expanding the collet to an outside diameter which is larger than the unstretched inside diameter of the sleeve, the sleeve thus being stretched on the collet to tightly secure it thereon to prevent slippage between the tube and the collet during material collection;

d. means for rotating the collet to wind the filamentary material on the sleeve, the interior filamentary layers of the wound package being engaged by the projections on the sleeve to inhibit relative motion between the package and the tubular sleeve during rotary collection.

3,910,514
METHOD AND APPARATUS FOR PRODUCING IMPROVED PACKAGES

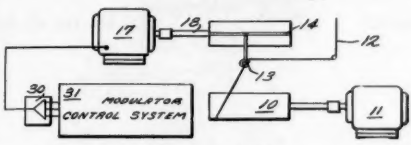
Clive Williams Hooper, 10, Canberra Crescent, Newport, Monmouth, England (NPT 3QQ)

Continuation of Ser. No. 261,670, June 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 167,043, July 28, 1971, abandoned, which is a continuation of Ser. No. 13,802, Feb. 24, 1970, abandoned. This application May 22, 1974, Ser. No. 472,419

Claims priority, application United Kingdom, Mar. 4, 1969, 11490/69

Int. Cl. B65h *54/38*

U.S. Cl. 242—18.1 21 Claims



1. An improved control for use with apparatus for winding yarn on a bobbin including a drive means for driving the bobbin, a traversing mechanism for repetitively traversing the yarn axially along the surface of the bobbin during wind up, and control means for the traversal mechanism for generating a rate control signal for driving the mechanism at a selected rate, said control means including means setting a mean driving rate signal as part of said rate control signal, ribbon breaking rate means for continuously generating a relatively long term cyclically varying signal as part of said rate control signal for varying the rate control signal between predetermined fixed limits respectively above and below the mean driving rate signal, and wherein said control means further includes modifying means for continuously generating a relatively short term varying signal as part of said rate control signal for continuously modifying the rate at which the rate control signal is varied between the predetermined fixed limits.

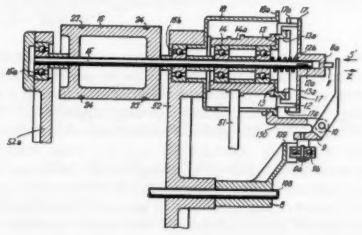
3,910,515
DEVICE FOR CONTROLLING THE OPERATION OF A WINDING UNIT IN AUTOMATIC WINDING MACHINES

Vladimir Prasil, Brno, Czechoslovakia, assignor to Elitex, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 103,845, March 5, 1971, abandoned, which is a continuation-in-part of Ser. No. 104,927, Jan. 9, 1971, abandoned. This application Nov. 8, 1973, Ser. No. 414,091

Int. Cl.[2] B65H *54/38*, *63/02*

U.S. Cl. 242—35.6 R 2 Claims



1. In a winding unit in automatic yarn winding machines for rotating a bobbin to wind a strand thereon from a supply cop, said unit being provided with a rotatable driving means driven through a clutch, a brake for stopping the driving means of the winding unit, a feeler for detecting the yarn wound upon the bobbin, a knotter drive between the supply cop and the bobbin controlled by said feeler for removing yarn breakage, and driven cams for controlling the clutch of the driving means of the winding unit and the brake for stopping the driving means of the winding unit, the improvement which comprises a control lever acting upon the clutch of the driving means and the brake for disengaging the clutch and engaging the brake, said driven cams including a continuously driven first control cam acting upon said control lever for periodically disengaging said clutch for eliminating pattern winding, a second control cam for driving the knotter driven together with said yarn knotter drive via a single-revolutionary clutch which is engaged upon yarn breakage, and a continuously driven third control cam for engaging said single-revolution clutch when said yarn feeler detects yarn breakage.

3,910,516
AUTOMATIC FILM-CASSETTE FABRICATION

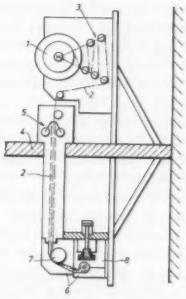
Franz Hoffacker, Langenfeld; Heinz Johanns, Leverkusen, and Horst Schruff, Muehlheim, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 29, 1974, Ser. No. 437,648

Claims priority, application Germany, Feb. 3, 1973, 2305383

Int. Cl. B65h *19/20*, *17/02*

U.S. Cl. 242—56 R 13 Claims



1. A machine for automatically winding a film on to a spool in a cassette, comprising a cassette chamber in a cassette chamber block for receiving the film cassette including the film spool, a threading device for the film connected to the cassette chamber and block, a film transport system disposed in a film transport block and a film windong drive, wherein:

a. the casette chamber has a film guide channel, slide coupling means connecting said cassette chamber and film transport blocks whereby said cassette chamber block is displaceable transversely of the direction in which the film is transported thereby to enable said cassette chamber to be brought from a cassette-preparing position in which said cassette chamber and its film guide channel are misaligned with said film transport system into a winding or threading position in which said cassette chamber and its film guide channel are aligned with said film transport system.

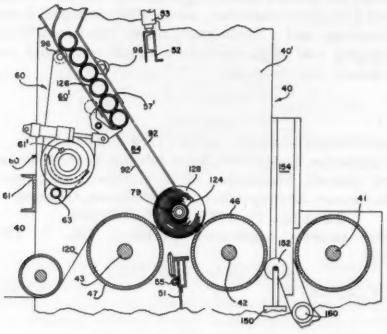
b. a telescopic winding shaft being disposed adjacent the cassette chamber, mechanical control elements connecting the telescopic winding shaft to the cassette chamber so that during its displacement, the cassette chamber moves the telescopic winding shaft axially through the mechanical control elements until it engages by force with the film spool in the cassette and

c. a control circuit is connected to initially actuate the threading device and the film transport system whereby the beginning of the film is pushed through the film guide channel into the cassette where it automatically engages the film spool.

3,910,517
MANDREL-LESS WINDER

Francis G. Harrison, III, Media, Pa., assignor to Eddystone Machinery Company, Chester, Pa.

Filed Apr. 5, 1974, Ser. No. 458,318
Int. Cl. B65h *19/20, 17/08*
U.S. Cl. 242—56 R **4 Claims**



1. A mandrel-less winder for continuously winding a web of sheet material into packages on core tubes comprising:

1. a frame having journalled therein a front, a middle drum and a rear drum, each of the drums being driven;
2. means for partially winding onto a first core tube a first package on the front drum;
3. means for transferring the first package from the front drum into a position between the middle and rear drums wherein the first package is continuously in contact with at least one of the drums;
4. means between the front and middle drums for cutting the continuously moving web; and
5. means for starting the cut web onto a second core tube to begin a second package on the front drum;

wherein the means for transferring the first package from the front drum into a position between the middle and rear drums includes (1) a hub assembly having hubs that engage the first core tube ends for supporting the first package, (2) a slide plate for supporting the hub assembly, and (3) a transfer assembly slidably supporting the slide plate wherein the transfer assembly rotates with reference to the frame, and the slide plate translates within the transfer assembly.

3,910,518
APPARATUS FOR AUTOMATICALLY EXCHANGING WINDING CORES IN WINDERS

Toshiaki Yamaguchi; Katsunori Fujita; Keizo Narita, and Takashi Sunda, all of Kyoto, Japan, assignors to Nishimura Seisakusho Co., Ltd., Kyoto, Japan

Filed June 18, 1974, Ser. No. 480,494
Claims priority, application Japan, June 21, 1973, 48-69987
Int. Cl. B65H *19/20*
U.S. Cl. 242—56 A **1 Claim**

1. Apparatus for automatically exchanging winding cores in winders comprising:

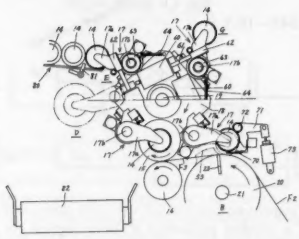
a plurality of winding core support means;

a turn table on which said plurality of winding core support means are arranged with regular angle intervals, said turn table being intermittently movable for each of said regular angle intervals so that the winding cores supported by the respective support means may be successively placed at a winding position;

a surface drive roller engageable with a winding core supported by winding core support means placed at said winding position in order to drive said winding core for rotation;

means for urging each of said winding cores to said surface drive roller when it is placed at said winding position;

a rotatable cut drum engageable with another winding core supported by another winding core support means which is placed at the rotary position immediately before said winding position, said cut drum having a cutting knife which is movable between the first position at which the knife edge of said cutting knife is extended outside from the periphery of said cut drum and the second position at which the knife edge of said cutting knife is retracted



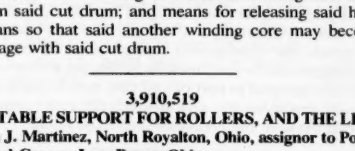
inside from the periphery of said cut drum, means for actuating said cutting knife between said two positions so that said cutting knife may take said first position at a predetermined rotary position of said cut drum immediately after rotary position at which said cut drum is engageable with said another winding core;

hook means for retaining said another winding core apart from said cut drum; and means for releasing said hook means so that said another winding core may become engage with said cut drum.

3,910,519
SELECTABLE SUPPORT FOR ROLLERS, AND THE LIKE

Rudolph J. Martinez, North Royalton, Ohio, assignor to Portable Pool Covers, Inc., Berea, Ohio

Continuation-in-part of Ser. No. 343,355, March 21, 1973.
This application Feb. 7, 1974, Ser. No. 440,599
Int. Cl. B65h *17/02*
U.S. Cl. 242—68 **11 Claims**



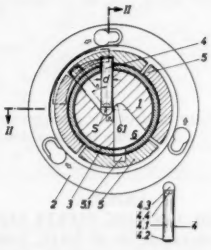
1. An apparatus comprising a deck means, a plurality of supports mounted on said deck means in spaced relationship with respect to one another, a roller means having a length extending to the entire plurality of said supports for winding and unwinding flexible material thereon and therefrom, and a member extending substantially radially from said roller means, each said support comprising a first portion for receiving and supporting said roller means in a first position and a second portion engaging said roller means in a second position independent of said first portion, said second portion having a part thereof which vertically overlies at least a part of said roller means when said roller means is supported in said second portion, means for rotating said roller means when said roller means is positioned within said first portion of said supports, said extension member of said roller means contacting said deck means and restraining rotation of said roller means when said roller means is positioned within said second portion of said supports whereby said flexible material is

wound onto and from said roller means when said roller means is positioned in said first portion of said supports and is prevented from unwinding from said roller means when said roller means is positioned in said second portion of said supports.

3,910,520
BOBBIN CHUCK FOR THE SHAFTLESS RETENTION OF CYLINDRICAL BODIES OF ROTATION

Wilhelm Mosser, Darmstadt, Germany, assignor to Dr. Otto C. Strecker KG, Hesse, Germany

Filed Feb. 14, 1974, Ser. No. 442,593
Claims priority, application Germany, Feb. 22, 1973, 2308755
Int. Cl. B65h *75/24*
U.S. Cl. 242—68.4 **13 Claims**



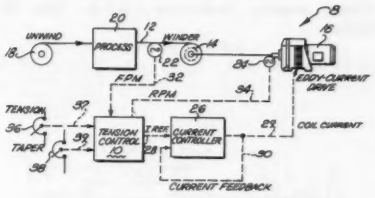
1. A chuck for engaging a rotatable body having a hole bounded by an inner circumferential surface, comprising an elongated inner core provided with a plurality of recesses extending from the proximity of the longitudinal axis of said inner core to the outer circumference of the latter; a plurality of thrust members each having one end portion accommodated in one of said recesses, and a free end portion located radially outwardly of said outer circumference of said inner core; means for mounting the respective thrust members in the respective recesses for pivoting movements about pivoting axes which are proximate, parallel to and radially offset from said longitudinal axis, between respective retracted positions and erected positions; a plurality of jaws, each supported on said free end portions of two of said thrust members and having an outer engaging surface juxtaposable with said inner surface; and means circumferentially interconnecting said thrust members so as to synchronize said pivoting movements thereof about their respective axes at least when a force is applied to at least one of said thrust members tending to move the same toward said erected position thereof, whereby said outer engaging surfaces of said jaws engage said inner surface and center the same with respect to said longitudinal axis of said inner core.

3,910,521
WINDER CONTROL

Gerald F. O'Callaghan, and John M. Haurykiewicz, both of Kenosha, Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 21, 1972, Ser. No. 317,350
Int. Cl.² B65H *23/20, 77/00*
U.S. Cl. 242—75.51 **17 Claims**

16. A control for maintaining a predetermined tension on material being transferred between a source of material and a roll wherein the predetermined tension is dependent upon the instantaneous radius of the roll of material comprising, first sensing means for sensing the angular velocity of the roll of material and establishing a first signal indicative of the angular velocity of the roll of material, second sensing means for sensing the linear velocity of the material and establishing a second signal indicative of the linear velocity of the material, dynamic compensation means for establishing a dynamic compensation signal, means including a divider means for establishing a radius signal indicative of the instantaneous radius of the roll of wound material, summing means for summing said instantaneous radius signal and said dynamic compensation signal and establishing a control signal indicative of the desired tension to be applied to said material, drive means for driving said roll of material, control means responsive to said control signal for energizing said drive means to maintain a predetermined tension on said material which

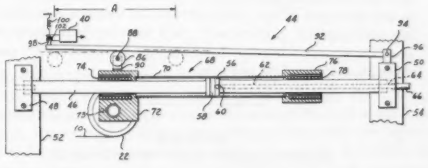


tension is dependent upon the instantaneous radius of the material on the roll and comparator means responsive to said first sensing means to render said divider means inoperative at a predetermined angular velocity of said roll of material, and wherein said dynamic compensation means includes friction compensation means for compensating for friction in the winder, said friction compensation means including means responsive to said second signal for establishing a friction compensation signal dependent upon the linear velocity of the material being transferred and operative to direct said friction compensation signal to said summing means.

3,910,522
WEB TENSION CONTROL SYSTEM

Frank X. Lee, New York; Leonard C. Krimsky, Spring Valley, and Donald R. Freytag, Monroe, all of N.Y., assignors to Worldwide Converting Machinery, Inc., Allendale, N.J.

Filed Sept. 18, 1974, Ser. No. 506,997
Int. Cl. B65h *59/00*
U.S. Cl. 242—75.53 **11 Claims**



1. Apparatus for regulating the tension in a web including in combination, a rod mounted on said frame, a piston on said rod, a cylinder carried by said rod and said piston for movement relative thereto, a dancer roll adapted to be subjected to tension in said web, means mounting said dancer roll on said rod for movement therealong, means connecting said cylinder to said dancer roll mounting means for movement therewith, and means for biasing said cylinder and piston for relative movement in a direction against the direction of action of said web tension on said dancer roll.

3,910,523
ARRANGEMENT FOR PNEUMATIC PIPING OF CARGOES IN CONTAINERS

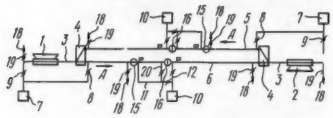
Adolf Moritsovich Alexandrov, Federativny prospekt, 6, korpus 3, kv. 8; Jury Abramovich Isimbler, Sojuzny prospekt, 10, kv. 261; Vladimir Efimovich Aglitsky, Zatsepsky val, 6/13, kv. 61; Jury Arnoldovich Topolyansky, Matveevskaya ulitsa, 10, korpus, 4, kv. 233; Sergei Mikhailovich Susekov, shosse Entuziastov, 208. Korpus 4. kv. 442, all of, Moscow; Dmitry Rudolfovich Gun, Komosomolskaya Ulitsa, 7, Kv. 29, Ljubertsy Moskovskoi oblasti, and Dmitry Evgenievich Geints, Flotskaya ulitsa, 16, kv. 116, Moscow, all of U.S.S.R.

Filed Feb. 28, 1974, Ser. No. 447,047

Claims priority, application U.S.S.R., May 30, 1973, 1926413

Int. Cl.[2] B65G *51/08*

U.S. Cl. 243—6 **2 Claims**



1. An arrangement for the pneumatic piping of cargoes in containers, comprising: loading-unloading terminals; pipeline connecting said loading-unloading terminals; main source of a compressed gas flow in said pipeline; intermediate source of a compressed gas flow; first and second sluice gates provided at some distance one from the other in said pipeline; a pipeline portion limited by said sluice gates; a first branch pipe having a valve therein and communicating said intermediate compressed gas flow source with said pipeline portion and being connected thereto proximate to said first sluice gate; a second branch pipe having a valve therein and communicating said pipeline with said intermediate gas flow source and being connected to said pipeline downstream of the second sluice gate and proximate thereto in the direction of said containers travel; a third branch pipe having a valve therein being arranged in said pipeline upstream of and proximate to said first gate in the direction of the containers travel and communicating with the atmosphere; and a further branch pipe for gas discharge having a valve therein being connected at one of its ends to said pipeline portion upstream of and proximate to said second sluice gate and connected at its opposite end to said first branch pipe upstream of said first branch pipe valve in the direction of the containers travel thereby communicating said pipeline portion with said intermediate compressed gas flow source whereby the container is continuously passed through said pipeline portion.

3,910,524
DOWNRIGGER, MOTOR AND REEL

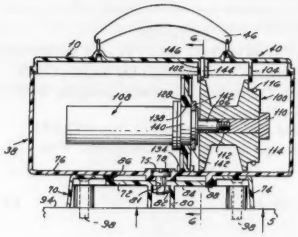
Harold Ireland, 26235 W. Warren, Dearborn Heights, Mich. 48127

Filed Jan. 7, 1974, Ser. No. 431,229

Int. Cl.[2] A01K *89/012, 91/00;* **B65H** *75/34*

U.S. Cl. 242—106 **3 Claims**

1. A downrigger comprising a casing, an electrically actuated power package including a reversible electric motor mounted in said casing, channel means within said casing, a support partition slidably received in said channel means, said power package being mounted on said support partition whereby the power package may be removed by sliding the support partition out of the channel means, a reel for a line drivingly connected to the power package, switch means between said motor and a source of electrical power to actuate said motor in the forward or reverse direction to extend or retract a line on the reel, and electrical control means connected to said motor to cause de-energization of the motor upon retraction of a line on the reel to a desired extent.



3,910,525
AUTOMATIC LOCKING SAFETY BELT REEL

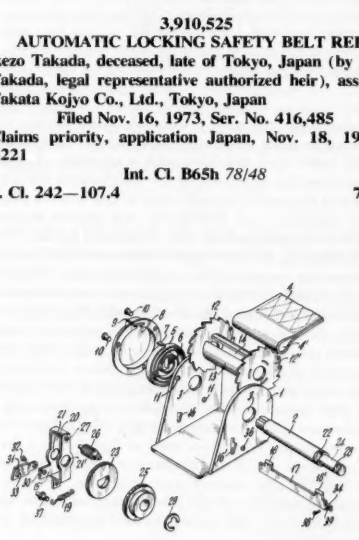
Takezo Takada, deceased, late of Tokyo, Japan (by Juichiro Takada, legal representative authorized heir), assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1973, Ser. No. 416,485

Claims priority, application Japan, Nov. 18, 1972, 47-115221

Int. Cl. B65h *78/48*

U.S. Cl. 242—107.4 **7 Claims**

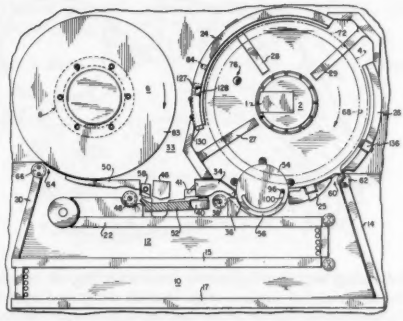


1. An automatic locking safety belt take-up reel comprising a shaft, a belt winding reel mounted on the rotatable with said shaft, a ratchet wheel mounted on and rotatable with said shaft, a pawl supported for movement between an advanced position engaging and locking said ratchet wheel and a retracted ratchet wheel disengage position spring means biasing said shaft and reel to rotate in a belt wind-up direction, a first gear mounted on and rotatable with said shaft, a second gear proximate said first gear and freely rotatable on said shaft, a rotatable pinion member supported for translational movement and engaging said first and second gears, and actuating means responsive to the translational movement of said pinion member for advancing said pawl to its ratchet wheel locking position to prevent rotation of said reel in a belt withdrawal direction.

3,910,526
PNEUMATIC TAPE-THREADING APPARATUS FOR TAPE TRANSPORT

Roger Mosciatti, Coram, N.Y., assignor to Bucode, Inc., Bohemia, N.Y.

Filed Apr. 12, 1974, Ser. No. 460,478
Int. Cl.[2] G11B *15/58, 23/12*
U.S. Cl. 242—182 10 Claims



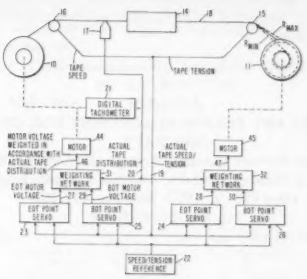
1. In a tape transport mechanism having a base surface, apparatus for automatically threading tape onto a take-up reel or cartridge from a supply reel or cartridge of the type having a pivotally mounted latching element attached to the outer periphery of the cartridge, said latching element being rotatable to an open or closed position, said take-up reel or cartridge and said supply reel or cartridge being mounted for rotational movement in a substantially horizontal plane and being laterally spaced from one another, the distance between said take-up reel or cartridge and said supply reel or cartridge being designated the tape path, comprising: means for pneumatically guiding the tape from said supply reel or cartridge, through said tape path and onto said take-up reel or cartridge; means positioned adjacent said supply reel or cartridge for engaging said supply cartridge latching element and rotating said latching element across said tape transport base surface approximately **180** degrees, thereby defining the path of travel of said latching element; and means for providing edge support for said pneumatically guided tape along said tape path, said edge support means including a vertically movable platform positioned in the path of travel of said latching element.

3,910,527
WEB DISTRIBUTION CONTROLLED SERVOMECHANISM IN A REEL-TO-REEL WEB TRANSPORT

Otto R. Buhler; Joseph T. Cutter; John P. Mantey, all of Boulder, and David R. Wood, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 8, 1974, Ser. No. 449,577
Int. Cl.[2] B65H *59/38;* G03B *1/04;* G11B *15/32*
U.S. Cl. 242—186 14 Claims

1. A reel-to-reel web transport, comprising:
a supply reel and a motor for driving said supply reel,
a take-up reel and a motor for driving said take-up reel,
a length of unbuffered web extending between said reels,
parameter sensing means providing an actual-web-parameter signal indicative of the magnitude of a parameter of said length of unbuffered web,
reference means providing a reference parameter signal indicative of the desired magnitude of said parameter,
a plurality of design-point servos constructed and arranged to be controlled by said parameter sensing means and said reference means and to provide an output signal in accordance with an assumed distribution of the web between said supply reel and said take-up reel,
distribution sensing means providing an actual-web-distribution signal indicative of the actual web distribution between said reels,
signal blending means controlled by said distribution sensing means, said blending means receiving the outputs of

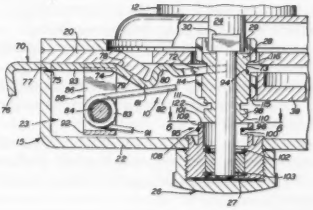


said point servos as a plurality of inputs, and being operative to weight said outputs in accordance with said actual-web-distribution signal to provide an output signal in accordance therewith, and
means controlled by the output of said signal blending means operable to energize said supply reel motor and said take-up reel motor.

3,910,528
FREE SPOOL MECHANISM

Gregory D. Copeland, Fayetteville, Ark., assignor to Shakespeare of Arkansas, Inc., Fayetteville, Ark.

Filed Sept. 14, 1973, Ser. No. 397,285
Int. Cl.[2] A01K *89/02*
U.S. Cl. 242—216 9 Claims



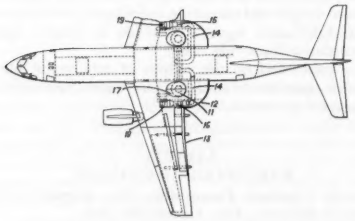
1. A free spool mechanism for a fishing reel having a frame, a line spool and a crank rotatably mounted on the frame, motion transmitting means interconnecting the crank and line spool, the crank, motion transmitting means and line spool comprising a drive train of multiple rotatable members, a clutch means interconnecting at least two of said rotatable members, one of said rotatable members being axially translatable selectively to engage and disengage said clutch means, a shift mechanism to effect translation of said one rotatable member, said shift mechanism comprising, a shift member movable between a first and a second position, a spring means continually engaging said shift member to bias said shift member toward said first position, said shift member engaging said frame to arrest the biasing action of said spring means and permit rotation of said one rotatable member free from biasing contact with said shift member and the affect of said spring means when said shift member is in said first position, an aperture in said frame through which said shift member extends, a knob means on said shift member exteriorly of said

frame to receive the application of a radial force, a follower and an engaging means on said shift member interiorly of said frame, said engaging means actuating the translatable member of said drive train, a ramp on said frame engaged by said follower, the application of radially inwardly directed pressure to said knob means when said shift member is in the first position slides said follower along said ramp and effects compound movement of the shift member and the engaging means thereon to translate said rotatable member and disengage said clutch means when said shift member has been moved to the second position.

3,910,529
AUXILLARY ENGINE PLACEMENT FOR STOL AIRCRAFT

Peter Marten Herbert Putnam, Welwyn Garden City, England, assignor to Hawker Siddeley Aviation Limited, England

Filed Oct. 1, 1973, Ser. No. 402,203
Int. Cl.[2] B64C *29/00*
U.S. Cl. 244—12 B **4 Claims**

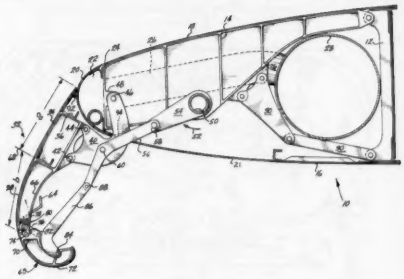


1. An aircraft with STOL capability, comprising:
wing structure having top and bottom surfaces,
at least one turbine-driven lift fan to provide lifting thrust, at least one gas turbine engine constituting a gas generator buried in said wing structure between said top and bottom surfaces and providing efflux gases to power the lift fan turbine,
at least one plenum chamber enclosed within said wing structure between said top and bottom surfaces from which plenum chamber said gas generator receives all of its air supply,
a first air intake opening in said top wing structure surface for admitting air to said plenum chamber,
a second air intake opening in said bottom wing structure surface for also admitting air to said plenum chamber,
said first and second air intake openings providing the total air intake area for said plenum chamber,
closure means for effecting complete closure of the total area of both said first and second intake openings when said gas generator is not in use, said closure means comprising first and second sets of movable louvre blades mounted at said first and second intake openings, respectively, and
spring means for biasing said louvre blades to close said openings when said generator is not operating and for permitting said louvre blades to open automatically in response to differential pressure created when said generator is operating,
said plenum chamber being large enough to contain a sufficient volume of air to permit said generator to start when said intake openings are both closed by said louvre blades.

3,910,530
LEADING EDGE FLAP

Varnell L. James, Enumclaw, and Eugene G. Hill, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 7, 1973, Ser. No. 413,606
Int. Cl.[2] B64C *3/50*
U.S. Cl. 244—42 D **8 Claims**



1. Leading edge flap apparatus retractable into an opening in the lower airfoil surface of an aircraft wing, said opening being located rearwardly of the leading edge portion thereof, comprising:
flap means defining an airfoil section and having a rigid trailing surface panel, a rigid structural member rigidly affixed to said trailing surface panel, a flexible central surface panel integrally connected to said trailing surface panel, a rib rigidly connected to said rigid structural member, said rib being spaced from and extending downwardly and forwardly below said central surface panel when said flap means is in an extended position, and a bullnose, said bullnose being pivotally connected at a first point thereon to said rib,
a first arm having one end thereof rigidly connected to said rigid structural member, the other end thereof being pivotally connected to said wing adjacent to and rearwardly of said leading edge,
a crank means pivotally connected at a first point between the ends thereof to said first arm,
a flange connected to said flexible central surface panel at a location adjacent said bullnose,
first link means pivotally connected to said crank means at a second point thereon, said second point on said crank means being spaced from said first point on said crank means, and pivotally connected to said bullnose at a point thereon spaced from said first point on said bullnose,
second link means pivotally connected to said bullnose at a point thereon spaced from said first point on said bullnose and pivotally connected to said flange,
actuating means mounted in said wing rearwardly of said leading edge and movable between at least a first and a second position, said actuating means operatively connected to said crank means, said actuating means in said first position causing said flap means to retract into said opening and in said second position causing said flap means to extend downwardly and forwardly from said opening and causing movement of said crank means and said first link means such that said bullnose is pivoted to a position downwardly of and adjacent to said central panel to form a smooth leading edge flap surface, said actuating means in said first position cooperating with said crank means and said first and second link means to fold said bullnose to a position above said central panel and to flex said central panel to conform to the curvature of the bottom airfoil surface of said wing, said actuating means in said second position cooperating with said crank means and said first and second link means to flex said central panel to form a smooth curved upper surface for said flap means in conjunction with said trailing panel and

to pivot said bullnose to operably mate with the forward edge of said central panel to form a downward and rearward continuation of said curved upper surface.

3,910,531

SHELL-TYPE STRUCTURE FOR LIGHT AIRCRAFT

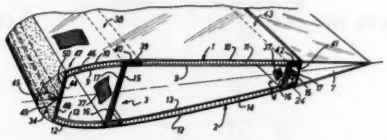
Gerard Leomand, Chaville, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Oct. 16, 1973, Ser. No. 406,840

Claims priority, application France, Oct. 17, 1972, 72.36756; Aug. 8, 1973, 73.28582

Int. Cl.² B64C *1/00*

U.S. Cl. 244—119 **3 Claims**



1. An aircraft structural element for connection to other structural elements comprising

a first skin made of resin-preimpregnated reinforcing fabric,

a second skin made of resin-preimpregnated reinforcing fabric,

and a cellular core,

said first skin, said second skin and said cellular core cured together in a mold in the ultimate shape of the structural element,

said cellular core interrupted at zones destined to form junctions with other elements, the skins of the element at each such zone bonded together to form zones of engagement for the connecting lugs or flanges of other elements.

3,910,532

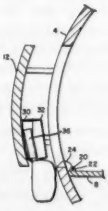
INFLATABLE DEPLOYMENT SYSTEM AND METHOD

William H. Fischer, Belmar, N.J., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 25, 1974, Ser. No. 464,022

Int. Cl.² B64D *25/14*

U.S. Cl. 244—137 P **8 Claims**



1. Apparatus for evacuation from an elevated egress hatchway of an aircraft to a lower surface upon which the aircraft is disposed, comprising:

a fluid distensible member, of a generally elongate configuration when fully inflated, disposed in an uninflated, folded configuration at the elevated egress hatchway with one end secured thereto;

packboard means to enclose the uninflated, folded fluid distensible member, said packboard means mounted at the elevated egress hatchway;

fluid distensible bladder means disposed in an uninflated, folded configuration in said packboard means to, when inflated, forcibly expel the uninflated folded fluid distensible member from said packboard; and

means disposed in said packboard means to inflate said fluid distensible bladder means.

3,910,533

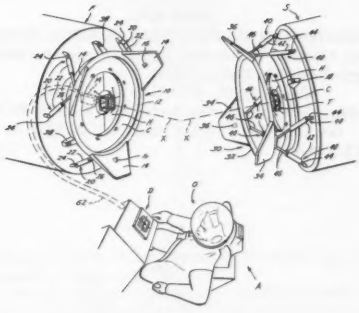
SPACECRAFT DOCKING AND ALIGNMENT SYSTEM

Donald C. Cheatham, Seabrook, and Richard Reid, Houston, both of Tex., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration office of General Counsel-Code GP, Washington, D.C.

Filed June 15, 1973, Ser. No. 370,582

Int. Cl.² B64G *1/00*

U.S. Cl. 244—161 **13 Claims**



1. An apparatus for indicating alignment along a docking axis of a first body and a second body during docking to assist in such docking, comprising:

a. target means mounted with the second body for providing an indication of the relative alignment between the first body and the second body, said target means including a visibly marked area on the second body and screen means mounted with the second body spaced from said visibly marked area for obscuring view of said visibly marked area when the bodies are aligned;

b. monitor means mounted with the first body for observing said target means and forming an output indication thereof to determine the relative alignment between the first body and the second body; and

c. means for forming a display of the output of said monitor means to assist an operator of the first body during docking.

3,910,534

GREAT-LENGTH FROGS FOR VERY HIGH SPEED TRAFFIC RAILWAY TRACKS

Robert Claude Perrot, Pont de Briques, France, assignor to Societe des Acieries de Paris CT d'Outreau, Paris, France

Filed June 27, 1974, Ser. No. 483,622

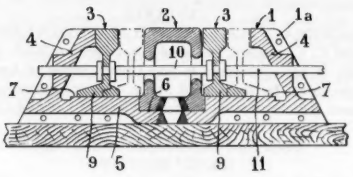
Claims priority, application France, Jan. 3, 1974, 74.140; Mar. 5, 1974, 74.7435

Int. Cl.² E01B *7/14*

U.S. Cl. 246—468 **5 Claims**

1. Crossing frog of relatively great length for railway tracks with cross members for supporting the running rails, for high speed railway traffic, which comprises for each rail a U-sectioned flat-bottomed cradle bearing on said cross members and symmetrical lateral side wings converging toward each other, a point bearing on the bottom of said cradle, a pair of wing rails constituting the running rails housed on either side

of said point and movable transversely in relation thereto within the limits allowed by the side wings of said cradle, and



means for rigidly interconnecting said point and said wing rails for translation.

3,910,535

APPARATUS FOR SUPPORTING A MANIPULATOR ARM

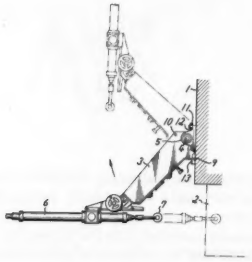
Makoto Ohnaka, Yokohama, Japan, assignor to Shiroyama Kogyo Kabushiki Kaisha, Japan

Filed July 10, 1974, Ser. No. 487,063

Claims priority, application Japan, Apr. 8, 1974, 49-39957

Int. Cl.[2] F16F *15/00;* **F16M** *1/00;* **B23Q** *3/18*

U.S. Cl. 248—16 **2 Claims**



1. Apparatus for supporting a manipulator on the frame of a machine or the like comprising a support arm for said manipulator, pivotal means pivotally supporting one end of said support arm on said machine frame for pivotal movement about a vertical axis, a manipulator device carried on the other end of said support arm, said support arm being pivotal between an operative position wherein said manipulator device is operable to perform manipulating functions on a workbench on said machine and a second position wherein said support arm and manipulator device are in a position disposed to one side of said workbench to provide unobstructed and ready access to said workbench, said support arm having a base portion which extends substantially perpendicularly from said machine frame when said support arm is in said operative position and an outer portion disposed at an obtuse angle relative to said base portion, said base portion of said support arm extending substantially parallel to said machine frame when in said second position, a stop member secured to said machine frame and having a vertically disposed opening, said support arm having a vertical passage which is axially aligned with said opening in said stop member when said support arm is in said second position, said vertical passage in said support arm being located substantially at an intermediate position of said support arm between said base portion and said outer portion, a pin insertable in said axially aligned holes in said stop member and said support arm when the latter is in its second position to thereby secure said support arm and manipulator device in a position providing unobstructed and ready access to said workbench, a retaining segment fixed to a front end portion of the base of said support arm, said retaining segment having openings, said machine frame having openings axially aligned with said openings in said retaining segment when the support arm is in said operative position, and threaded means received in said axially aligned openings in said retaining segment and said machine frame for securing said retaining segment and said support arm to said machine frame in the operative position of the support arm.

3,910,536

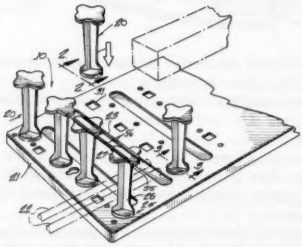
DISTRIBUTING POST FOR WIRE INTERCONNECTING POINTS

Larry L. Sharp, Schaumburg, and Edmund J. Soltysik, Chicago, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed June 24, 1974, Ser. No. 482,217

Int. Cl.[2] F16L *3/22;* **H02G** *3/00*

U.S. Cl. 248—68 R **10 Claims**



1. A post for aligning cables or the like above a backboard or like mount, comprising a fastener, a mast and a top, the fastener including means for securing the post to the backboard in a pre-determined location and in a pre-determined angular orientation relative to the backboard, said mast including web means extending from the fastener in a pre-determined angular orientation, said top being substantially planar in configuration and positioned generally perpendicular to the axis of said fastener and mast, the peripheral edge of the top lying completely outside the peripheral limits of said mast, the top including means projecting outward therefrom in cantilevered fashion for receiving and retaining an interconnector extending between said top and the top of another post mounted on the backboard, said interconnector receiving and retaining means projecting outwardly from the top in substantially the same angular direction as said webs with said webs inhibiting post bending in the direction in which the interconnector receiving and retaining means extends.

3,910,537

DEVICE FOR SUPPORTING FLAT ELECTRICAL CABLES

Bernard Andre' Laboue, Goussainville, and Rene Qu'Hen, Gressy, both of France, assignors to Compagnie Honeywell Bull, Paris, France

Filed June 11, 1974, Ser. No. 478,409

Claims priority, application France, June 19, 1973, 73.22309

Int. Cl.[2] F16L *3/22*

U.S. Cl. 248—68 CB **5 Claims**

1. A device for supporting a plurality of flat electrical cables comprising:

a plurality of holding members, each of said members including:

a first substantially rectangular side which is flat and provided with at least one pair of coupling means,

a second substantially rectangular side parallel to said first side, said second side having

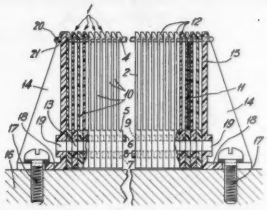
a projection at a first end, said projection provided with at least one pair of coupling means,

an abutment at a second end opposite said first end, said abutment of the same thickness as said projection and coming into contact with an adjacent member, and

a flat face between said first and said second ends;

each of said pairs of coupling means including a male member and a female member for interlocking with another pair of coupling means provided on an opposite side of an adjacent member; and

a pair of terminal angle brackets for attaching said device to a support, each of said brackets including:



a first section with an opening for passing a bolt therethrough, for attaching said bracket to said support,

a second section substantially perpendicular to said first section, said second section having a flat face with at least a pair of coupling means for interlocking with another pair of said coupling means on one of said holding members; and

said members and said pair of brackets combining to form an assembly of parallel members for holding one of said cables within each of the substantially rectangular hollow passageways formed between pairs of adjacent members and between pairs of said members and said brackets.

3,910,538

JOINTED STAND FOR DIAL GAGES

Carlo Baitella, Hohmoos 38, 8051 Zürich, Switzerland

Filed May 6, 1974, Ser. No. 467,465

Claims priority, application Switzerland, May 4, 1973, 6326/73

Int. Cl.² B61L *25/00*; **F16C** *11/06*

U.S. Cl. 248—122 **9 Claims**

1. A jointed stand comprising:

a base;

a first arm;

a first ball joint connecting one end of said first arm to said base for swiveling movement relative thereto;

a joint assembly connected to the opposite end of said first arm, said first arm being rotatable about its axis relative to said joint assembly;

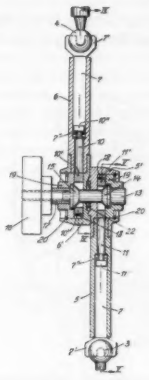
a second arm having one end connected to said joint assembly and rotatable about the axis of said second arm relative to said joint assembly;

a second ball joint connected to the other end of said second arm;

a holder mounted on said second ball joint for swiveling movement relative to said second arm, each of said ball joints including a ball member and a socket member engaging said ball member and compressible therearound upon relative axial displacement of said socket member and the respective arm;

a respective slide rod extending through each of said arms and engaging one of the members of the respective ball joint for axial displacement of the respective socket member, each of said slide rods being formed with a ring at said joint assembly, each slide rod further including a linkage means intermediate the ends thereof for permitting rotative movement of opposite ends of said slide rod about its longitudinal axis;

a respective conical disk for each respective ring having an axis eccentric to the axis of the respective ring and bearing upon the inner periphery thereof for axial displacement of the respective slide rod upon increasing insertion of the respective disk into the respective ring, said arms



being swingable on said assembly about the axes of the respective disks; and

a single locking element angularly actuatable about a disk axis to draw both of said disks into the respective rings, thereby locking said arms against rotation and swingable displacement relative to said assembly and clamping said ball joints against swiveling movement.

3,910,539

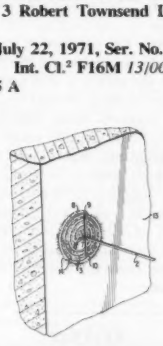
ONE-PIECE ADHESIVELY SECURED ANCHOR

Lloyd R. Cutler, 3 Robert Townsend Lane, Setauket, N.Y. 11733

Filed July 22, 1971, Ser. No. 165,208

Int. Cl.² F16M *13/00*

U.S. Cl. 248—205 A **1 Claim**



1. A one-piece anchor having a base portion for receiving adhesive for securing the anchor to a rigid supporting surface and having a shank portion extending generally perpendicular to the base portion to receive a generally cantilever load, said base portion comprising a planar spiral having spaced coils terminating in an inner end and in a peripheral outer end, said shank portion comprising an extension of the inner end bent upwardly to extend from one face of the spiral, the outer end having an end portion which is bent upwardly and inwardly to extend across said one face and contact the top of the coils with the terminal end of the end portion being looped around the shank at a point adjacent the base, said coils being suffi-

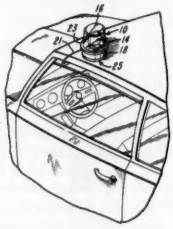
ciently spaced from each other to receive an application of adhesive to a major portion of their surfaces and to provide an open area to permit the dispersion and evaporation of the solvent material in the adhesive.

3,910,540

MAGNETIC BASE ASSEMBLY FOR EMERGENCY LIGHT UNIT AND THE LIKE AND METHOD OF MAKING SAME

Robert D. Kayler, 3533 Valleywood Drive, Kettering, Ohio 45429

Filed Jan. 10, 1974, Ser. No. 432,200
Int. Cl.² B60Q *1/56*
U.S. Cl. 248—206 A **7 Claims**



1. In an emergency light unit including a lamp supported within a light transmitting dome mounted on a generally pan-shaped housing having a substantially flat circular bottom wall surrounded by a band-like side wall, an improved compact magnetic base assembly for firmly attaching said light unit to the metal body of a motor vehicle, comprising a circular sheet metal base plate including a substantially flat upper wall portion positioned adjacent said bottom wall of said housing, a generally cylindrical skirt portion extending around said upper wall portion and projecting downwardly therefrom as an integral part of said base plate, said skirt portion having a diameter generally the same as the diameter of said bottom wall of said housing and forming generally a continuation of said side wall of said housing, means for securing said upper wall portion of said base plate to said bottom wall of said housing, a plurality of substantially flat permanent magnets each having parallel upper and lower surfaces with the flux path extending therebetween, means for securing said upper surfaces of said magnets to the bottom surface of said upper wall portion of said base plate, said magnets being disposed in an angularly spaced annular arrangement on said upper wall portion, said skirt portion has a height less than the thickness of said magnets between said upper and lower surfaces to permit said lower surfaces of said magnets to be magnetically attracted to the body of the vehicle, said skirt portion surrounds said annular arrangement of magnets and cooperates with said upper wall portion to form an enclosure for said magnets, and a coating of moisture resistant material covering said base plate and said magnets.

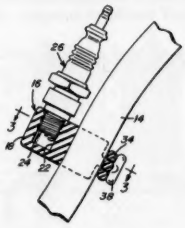
3,910,541

SPARK PLUG HOLDER

Ronald L. German, 5131 Blairwood Dr., LaPalma, Calif. 90623

Filed June 18, 1974, Ser. No. 480,499
Int. Cl.² F16M *13/00*
U.S. Cl. 248—231 **3 Claims**

1. An article holder for securement about an elongated member, said holder comprising a one piece body of shape retentive, deformable and elastic material and including article support means for supporting an article therefrom, said body further including spaced generally parallel integral leg portions of panel-like configuration projecting endwise outward from one side thereof, the free end of one of said leg portions including an integral endwise outwardly projecting stem whose free outer end terminates in an integral eye portion and the free end of the other leg portion including a similar integral endwise outwardly projecting stem whose outer end terminates in an integral crosshead removably insertable through said eye portion, the portion of the side of said body outwardly from which said leg portions project being contoured to define a semi-cylindrical pocket opening laterally outwardly between said leg portions, said leg portions being disposed in planes paralleling the center axis of said semi-cylindrical pocket, said pocket defining an abutment



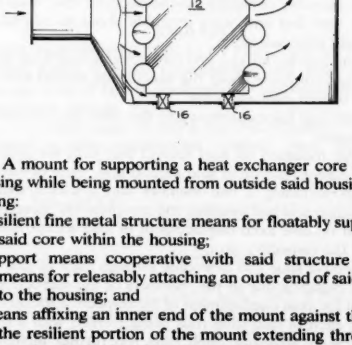
surface against which one side of a cylindrical structural member may be abutted, the effective length of said leg portions and their stems being such, when said leg portions and stems are slightly elongated and bowed, to allow the stems to be secured together by insertion of said crosshead through said eye portion and to define, together with said pocket, a cylindrical area therebetween of substantially the same radius of curvature as the radius of curvature of said pocket, said body having a bore formed therein opening outwardly through another side of the body, said bore being of a diameter adapted to wedgingly receive the threaded base of a spark plug therein.

3,910,542

HEAT EXCHANGER MOUNTING DEVICE

David George Bridgnell, Rolling Hills, and Frederick Walter Jacobsen, Los Angeles, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 4, 1974, Ser. No. 447,906
Int. Cl.² F28F *7/00, 3/12*
U.S. Cl. 248—358 AA **4 Claims**



1. A mount for supporting a heat exchanger core within a housing while being mounted from outside said housing comprising:

resilient fine metal structure means for floatably supporting said core within the housing;

support means cooperative with said structure means; means for releasably attaching an outer end of said mount to the housing; and

means affixing an inner end of the mount against the core; the resilient portion of the mount extending through an opening in the housing; the attaching means comprising

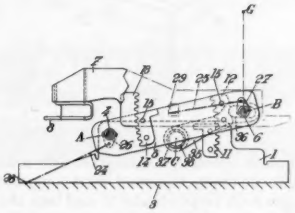
an extended peripheral portion overlapping adjacent edges of the housing surrounding the resilient portion of the mount and a plurality of adjustable fasteners for attaching the peripheral portion to the housing in order to cause compression of the mount against the core.

3,910,543

VERTICALLY ADJUSTABLE SEAT SUPPORTS

Francois Fourrey; Yves Pezier, both of Etampes, and Rene Droual, Ris Orangis, all of France, assignors to Etablissements Bertrand Faure, France

Filed Oct. 30, 1974, Ser. No. 519,263
Claims priority, application France, Dec. 5, 1973, 73.43463
Int. Cl.[2] B60N *1/02*
U.S. Cl. 248—396 **9 Claims**



1. Vehicle seat support adjustable vertically in inclination and in height, comprising a first lower rigid framework fast to the floor of the vehicle, a second rigid framework mounted pivotably around a horizontal axis connected to the first framework and extending over the width of the seat, a third rigid framework mounted pivotably around a second horizontal axis parallel to the first and connected to the second framework, first locking means easily operable by the seated person to actuate at will the locking and unlocking of the second framework in one or other of a plurality of its different angular positions of pivoting with respect to the first framework around the first axis, and second locking means easily operable by the seated person to actuate at will the locking and unlocking of the third framework in one or other of a plurality of its different angular positions of pivoting with respect to the second framework around the second axis, the first locking means comprising first and second gear sectors centered on the first axis and adapted to cooperate between themselves on locking, of which the first sector is fixed to the first framework and of which the second sector is mounted on the second framework so as to be movable with respect to the first sector under the control of a rotary cam operable by the seated person and the second locking means comprising third and fourth gear sectors centered on the second axis and adapted to cooperate between themselves on locking, of which the third sector is fixed to the third framework and of which the fourth sector is mounted on the second framework so as to be movable with respect to the third sector under the control of a second rotary cam operable by the seated person, the two cams being constantly urged elastically towards their angular positions corresponding to locking, the gear sectors mounted on the second framework being permanently fixed to the second framework.

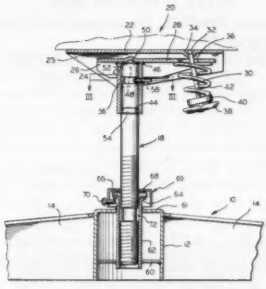
3,910,544

CHAIR CONTROL ADJUSTABLE POST

Carl J. Engstrom, 412 Marquette Trail, Pottawattomie Park, Michigan City, Ind. 46360

Filed Jan. 28, 1974, Ser. No. 437,514
Int. Cl.[2] F16M *11/00, 13/00*
U.S. Cl. 248—405 **1 Claim**

1. A swivel seat comprising a base, a seat, a vertical stem supporting said seat upon said base, a tubular member attached to the underside of said seat having a closed top end and extending downwardly therefrom in surrounding relation to the upper portion of said stem, the top end of said tubular member and the upper end of said stem having aligned ball receiving recesses, a ball bearing between the upper end of the stem and the top end of said tubular member riding in said recesses, said stem having a first circumferential groove adjacent said upper end thereof, a combination locking and retaining screw threaded through said tubular member and projecting into said first circumferential groove to maintain the ball in said recesses and to lock the stem and tubular member for co-rotation, a bearing ring around said stem riding in the bottom end portion of the tubular member to align the stem and tubular member, the lower end of said stem being circular in cross section to define a smooth surface, said smooth surface being interrupted only by a pair of threaded portions spaced apart by a second circumferential groove, said base having a hub with a sleeve providing an elongated bore receiving the threaded portions of the stem in sliding contact therewith to hold the stem in upright position on the base, said sleeve having an outturned end flange on the upper end thereof spaced from said hub, a manually rotatable adjustment collar threaded onto the lower end of said stem, said adjustment collar including an inverted cup shaped metal member with an aperture through the top end wall thereof larger than the stem with a nut secured to the underside of said top end wall, said nut being threaded onto said stem and resting directly on said outturned flange of said sleeve, a screw threaded through said cup shaped member underlying said outturned flange to limit lifting of the stem out of the sleeve of the base, said adjustment collar being located above said second circumferential groove, whereby said seat is freely rotatable on said stem when said combination locking and retaining screw is loose in said first groove and rotatable with said stem when tightened in said first groove and said stem is raised and lowered in said sleeve by rotation of said adjustment collar to and from a height aligning the second groove with the adjustment collar.



3,910,545

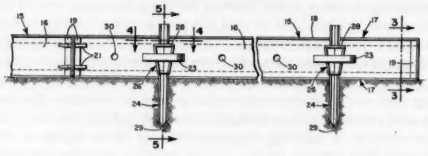
FORM-WORK WITH STAKE MOUNTING MEANS

Richard Langford, Reid Park, Mona Vale Rd., Ingleside, New South Wales, Australia

Filed Sept. 6, 1973, Ser. No. 394,628
Claims priority, application Australia, Sept. 6, 1972, 335/72
Int. Cl.[2] E01C *7/00*
U.S. Cl. 249—7 **10 Claims**

1. Concrete form-work comprising an edge beam having a stop flange projecting rearwardly from the beam at least at each of a plurality of pegging stations, means defining a peg clearance hole at each pegging station through which a peg may extend downwardly, a star-sectioned metal peg having a plurality of flanges, said metal peg at each station extending through said clearance hole and with at least one of its flanges

stepped to fit against the rear face of the edge beam and the under face of the stop flange, and a wedge adapted to be



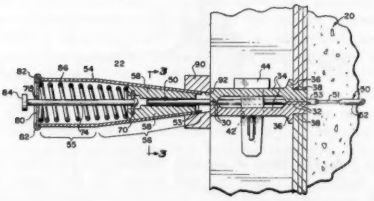
driven through said clearance hole to tighten the edge beam against the peg.

3,910,546

SHE-BOLT TYPE GRIPPER DEVICE FOR A CONCRETE WALL FORM TIE ROD

Frank T. Connors, Deerfield, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Nov. 22, 1974, Ser. No. 526,076
Int. Cl.² E04G *11/06, 17/06*
U.S. Cl. 249—40 **16 Claims**



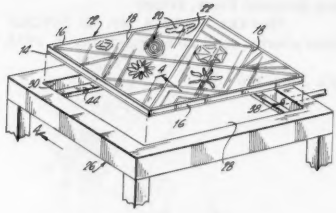
13. In a concrete wall form, in combination, a pair of upstanding wall form sides between which wet concrete is adapted to be poured in the formation of a concrete wall, each of said sides embodying edge-to-edge rectangular panels in the form of plywood facings and rectangular metallic reinforcing frames around the facings, a combined tie rod and spreader assembly for maintaining said form sides in their spaced apart relationship, said tie rod and spreader assembly embodying a horizontal tie rod having a medial portion designed for embedment in the concrete which is poured between said form sides, and projecting end portions which extend between and beyond the abutting side members of the reinforcing frames of the panels, and a pair of gripper devices disposed in gripping relationship with respect to said projecting end portions of the tie rod, each gripper device comprising a tapered tubular shell embodying a small front end and a large rear end, a plurality of correspondingly tapered, toothed-equipped jaw segments slidably disposed within said shell in circumferentially-arranged relationship and defining a chuck structure which receives the adjacent projecting end portion of the tie rod, a compression spring disposed in the shell and effective to bias the jaw segments forwardly in the shell, and means for effecting release of said sections from the adjacent projecting end portion of the tie rod when it is desired to remove the gripper device from said projecting end portion of the tie rod, and a pair of bottomless seating cups positioned against the outer faces of the abutting side members of the reinforcing frames, surrounding said projecting end regions of the tie rod, and having the small ends of the shells of the gripper devices fitting snugly therein.

3,910,547

MOLD FOR THE MANUFACTURE OF AN ARTICLE WITH RELIEF FEATURES

Angelo Varriano, 36-21 30th St., Long Island City, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,181
Int. Cl.² B28B *1/14, 7/06*
U.S. Cl. 249—104 **5 Claims**



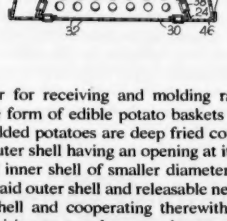
1. A mold insert which in combination with a supporting table defines a mold cavity, said mold insert comprising a rigid base having side walls perpendicular to said base at a periphery thereof, a plurality of elongated feature strips of rectangular cross section arranged within said side walls and bonded to said base, the height of said feature strips being at least equal to the height of said side walls, a transparent, resilient, tear resistant molding film stretched over and supported by said feature strips and side walls said molding film being fixedly secured to said side walls and curving downwardly over the outer edge of said side walls and underneath the base.

3,910,548

MEANS FOR MAKING POTATO BASKETS

John C. Giesfeldt, Milwaukee, Wis., assignor to Baskettes Ltd., Milwaukee, Wis.

Division of Ser. No. 144,747, May 19, 1971, Pat. No. 3,800,054. This application Nov. 27, 1973, Ser. No. 419,405
Int. Cl.² A23L *1/216;* **A47J** *43/20*
U.S. Cl. 249—141 **12 Claims**



7. A container for receiving and molding raw shredded potatoes into the form of edible potato baskets and wherein the molded shredded potatoes are deep fried comprising:

a perforated outer shell having an opening at its upper end,

a perforated inner shell of smaller diameter and shorter length than said outer shell and releasable nestable within said outer shell and cooperating therewith to define a cavity comprising an annular space between the sides of said shells and another space between the upper end of said inner shell and said opening, said annular space being wider at the upper end thereof than at the lower end thereof and said other space being of substantially the same diameter as said opening,

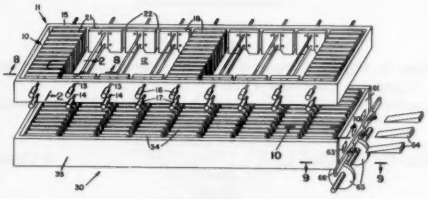
means for releasably maintaining siad inner and outer shells in nested relationship,
perforated plate means extending between the lower ends of said inner and outer shells for closing the lower end of said annular space,
and releasable perforated cover means on said container for closing said opening after said cavity is filled with shredded potatoes and during deep frying.

3,910,549

APPARATUS FOR DEPOSITING REINFORCING MEMBERS IN A GRATING MOLD

Leonard S. Meyer, Columbia, S.C., assignor to Sybron Corporation, Rochester, N.Y.

Division of Ser. No. 277,332, Aug. 2, 1972, Pat. No. 3,851,038.
This application Aug. 29, 1974, Ser. No. 501,643
Int. Cl.[2] E04G *17/00;* **B22D** *19/00*
U.S. Cl. 249—205 **12 Claims**



1. Apparatus for assembling reinforcing members to be inserted in a mold comprising:
a frame having a central opening extending through the frame from top to bottom and a plurality of holes in at least one side of the frame, some of said holes being located near the top of the frame and others of said holes being located near the bottom of the frame;
removable upper support members extending through the holes near the top of the frame into the central opening and removable bottom support members extending through the holes near the bottom of the frame into the central opening;
a plurality of blocks defining longitudinal and transverse channels in the central openings, each of the blocks having at least one hole through which one of the upper support members extends and at least one hole through which one of the lower support members extends;
whereby the reinforcing members may be assembled in intersecting stacks by removing the upper support members and placing the reinforcing members in the channels, and the stacked reinforcing members may be transferred as a unit to a mold by reinserting the upper support members, positioning the frame above the mold, and removing the lower support members.

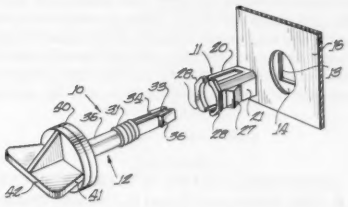
3,910,550

DRAIN PLUG ASSEMBLY

John Frederick Nelson, Richton Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 13, 1974, Ser. No. 469,692
Int. Cl.[2] B65D *41/04*
U.S. Cl. 251—144 **13 Claims**

1. A drain plug assembly for connection to a fluid container comprising: an embossment forming a recess in a wall surface of the said container, said recess including a base and a continuous sidewall having a predetermined height, an aperture formed in said base, a body member having a pair of spaced apart portions joined together at one end thereof and slot means extending from adjacent said one end to the other end of said spaced apart portions, first shoulder means formed on said spaced apart portions intermediate the ends thereof, second shoulder means formed at said other end of said spaced apart portions and cooperable with said first shoulder means to firmly hold said body portion within said aperture formed in said embossment and with said second shoulder means having an axial extent equal to or less than said predetermined height to maintain said second shoulder means totally within said recess and below the wall surface of said container, said spaced apart portions adapted for resilient movement toward one another during insertion of said body member into said aperture, a stem member having an elongated shaft to be inserted into said body member between said spaced apart portions, fastener means formed on said elongated shaft and in said body member to provide a locking action therebetween when said stem member is tightened to said body member, a head portion formed at an exterior end of said elongated shaft, said head portion providing an area radially outwardly of said shaft to completely overlie said apertured recess and engage the wall surface about said recess to form a seal thereabout when said stem member is tightened to said body member, whereby untightening of said stem from said body member will disengage said head portion from the wall surface about said recess and fluid from within said container will flow from between said slot means of said body member and said shaft.

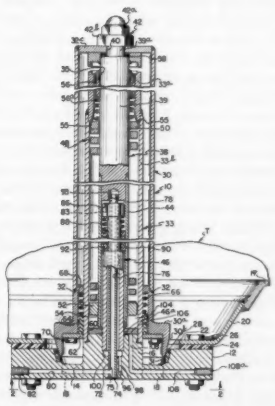


3,910,551

INTERNAL EMERGENCY VALVE FOR STORAGE TANK

Joseph H. DeFrees, 414 Liberty St., Warren, Pa. 16365

Filed Nov. 14, 1974, Ser. No. 523,586
Int. Cl.[2] F16K *31/122*
U.S. Cl. 251—144 **15 Claims**



1. In a remote controlled valve for a fluid storage tank adapted for positioning interiorly of the tank, comprising, a base having a fluid port therein, a hollow elongated housing plunger reciprocal to and from said port, said plunger being engageable with the periphery of said port to seal the port, said base being adapted for connection to a fluid discharge opening of an associated fluid storage tank whereby said

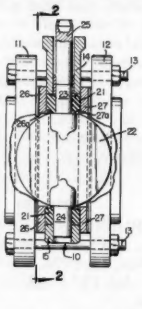
plunger can control fluid flow through the tank discharge opening, said valve being adapted for disposal substantially vertically and including a base cylinder extending outwardly from the base interiorly of said plunger, and being secured to said base, said base cylinder having an opening in the distal end thereof, a piston cylinder connected to said plunger and extending through said opening in said base cylinder in relative reciprocable relation thereto, means coacting with said piston cylinder for urging said piston cylinder and connected plunger toward said port whereby said plunger is urged into closed sealing relation with said port, a piston projecting from said base into said piston cylinder and coupled to said base, sealing means coacting between said piston and said piston cylinder, said piston defining in part a pressure cavity between said piston and said piston cylinder, and means for admitting actuating fluid to said pressure cavity to cause forced outward movement of said piston cylinder and attached plunger against the resistance of the first mentioned means, for opening said valve.

3,910,552

ADJUSTABLE WAFER BUTTERFLY VALVE

James B. Hills, Holden, and Robert H. Osthues, West Boylston, both of Mass., assignors to Worcester Controls Corporation, West Boylston, Mass.

Filed Nov. 18, 1974, Ser. No. 524,856
Int. Cl.[2] F16K *1/22, 1/226*
U.S. Cl. 251—148 **13 Claims**



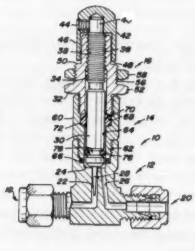
1. A wafer-type butterfly valve unit adapted for insertion between a pair of spaced pipe flanges in a pipeline wherein said flanges have a plurality of bolts extending therebetween in an axial direction transverse to said flanges for exerting axially directed forces upon said unit to retain said unit between said pipe flanges, said butterfly valve unit comprising a pair of separate metallic body halves of substantially semi-circular cross-sectional shape positioned in spaced, opposed relation to one another to define a substantially circular region therebetween, each of said body halves having a pair of spaced parallel planar end faces which are positioned in alignment with the spaced planar end faces of the other body half, each of said end faces being adapted to be positioned in spaced, substantially parallel relation to the pipe flanges, the face-to-face dimension between the spaced end faces of each body half being less than the spacing between the pipe flanges, adjustable fastening means extending between said body halves for exerting radially directed forces between said body halves to selectively vary the radial spacing between said body halves, a resilient seat ring of unitary annular configuration positioned in the substantially circular region between said body halves, a valve disc mounted for pivotal movement within said seat ring, the outer periphery of said valve disc being in engagement with the inner diameter of said seat ring and the outer diameter of said seat ring being in engagement with the spaced substantially semicircular inner surfaces of said opposed body halves whereby adjustment of said fastening means is operative to vary the dimensions of said substantially circular region to vary the forces exerted on said seat ring in a direction parallel to the pipe flanges thereby to vary the sealing forces between said seat ring and said valve disc, and a pair of separate, metallic spacer rings of flat, annular configuration disposed in spaced relation to one another in engagement with the aligned end faces of said opposed body halves respectively to fill the space between said end faces of said opposed body halves and the pipe flanges respectively, the outer diameter of each of said spacer rings being sufficiently large to maintain each spacer ring in metal-to-metal surface engagement with the adjacent aligned end faces of said body halves and in radially slidable engagement with said adjacent aligned end faces when the radial spacing between said body halves is varied by adjustment of said fastening means, the inner diameter of each of said flat spacer rings being less than the maximum adjusted diameter of the substantially circular region between said opposed body halves whereby said spacer rings define flat surface portions which overlie the outer diameter of said circular region and which engage and confine the end faces of said annular seat ring to exert axial forces on said seat ring in a direction perpendicular to said pipe flanges.

3,910,553

METERING VALVE

John R. Boylan, Cleveland Heights, Ohio, assignor to Nupro Company, Cleveland, Ohio

Continuation of Ser. No. 300,708, Oct. 25, 1972, abandoned. This application Apr. 11, 1974, Ser. No. 460,238
Int. Cl.[2] F16K *3/50*
U.S. Cl. 251—205 **4 Claims**



1. A metering valve including:

a body having an inlet and an outlet with a flow metering orifice positioned therebetween;

a stem member extending laterally into said body;

a tapered flow metering needle member carried by said stem and aligned with said orifice;

a bonnet member in which said stem is threadedly carried for adjusting movement to selectively vary the position of said needle member relative to said orifice;

an elongated body extension member having an inner end connected to said body and an outer end connected to said bonnet, a bore extending through said extension member and receiving said stem, the inner end of said extension member being threaded and received in threads formed in said body with a gasket between said inner end and said body at a location inwardly of said threads, the outer end of said bore being counterbored to a diameter substantially larger than said stem and terminating in a bottom wall which is inclined at an arcuate angle relative to said stem, a resilient guide ring member positioned in said counterbore and closely surrounding said stem, the length of said bore inwardly of said guide ring being sufficiently long such that when said stem is adjusted to its outermost position a major portion of said needle member is disposed within said bore whereby said extension member can be removed from said body with said needle shielded by said extension member;

said bonnet member being threadedly received in said counterbore and adapted to apply a compressive force to said

guide ring to cause it to relatively tightly engage said stem and generally conform to the configuration of the bottom wall of said counterbore; and,

a seal ring carried by said stem at a location inwardly of said guide ring, said seal ring comprising an O-ring received in a groove formed on said stem, said O-ring being located such that it is always within said bore and outwardly of said gasket irrespective of the position of adjustment of said stem.

3,910,554
VALVE

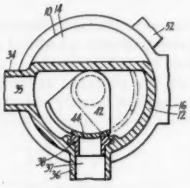
Robert Speedie, Flat 2, 10 Kokaribb Rd., Carnegie, Victoria, Australia (3163)

Filed June 5, 1974, Ser. No. 476,368

Claims priority, application Australia, June 13, 1973, 3649/73

Int. Cl.² F16K *5/10*

U.S. Cl. 251—208 **3 Claims**



1. A valve comprising a housing having a valve chamber therein, a first outlet passageway having an inner end which leads into said valve chamber, an inlet passageway having an inner end which leads into said valve chamber, the inner ends of said outlet and inlet passageways extending substantially at a right angle with respect to each other, a crank comprising a first crank arm journalled in said housing and having an inner end which extends into said chamber, a first crank plate secured to the inner end of said first crank arm, a second crank plate spaced apart from said first crank plate, mounting means associated with said second crank plate for rotatably securing said second crank plate in said housing and a valve member formed of an arcuate plate which is secured to said first and second crank plates only at a first end thereof which is disposed toward said inlet passageway so that a second end of said valve member disposed away from said inlet passageway is flexible relative to said crank plates under normal operating pressures, a sealing member having an arcuate inner surface which matches the arcuate shape of said valve member secured in said outlet passageway so as to form a valve seal between said sealing member and said valve member, an operating arm secured to said first crank arm and mounted so as to move said valve member from a first position where it is in sealing engagement with said sealing member to a second position where fluid may flow through said inlet passageway to said outlet passageway.

3,910,555
BUTTERFLY VALVES DISC WITH DOVETAIL GROOVE

Brad E. Bertrem, and Dennis L. Young, both of Tulsa, Okla., assignors to Dover Corporation, Tulsa, Okla.

Filed Dec. 26, 1973, Ser. No. 427,722

Int. Cl.² F16K *1/22*

U.S. Cl. 251—306 **4 Claims**

1. In a butterfly valve in which the periphery of a rotatable disc is sealed against a circumferential seat by circumferential compliant means, the improvement comprising:

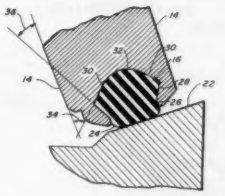
a. a circumferential sealing member comprising a torous of compliant material, said torous of circular cross-section;

b. a circumferential generally dovetail shaped groove in the circumferential surface of said disc;

c. said generally dovetail shaped groove being defined in cross-section perpendicular the plane of the disc by:

1. a short entrance section having spaced apart planar sidewalls parallel to the plane of said disc;

2. a divergent section having opposed diverging sidewalls, each connected to a said planar sidewall, each diverging sidewall diverging at the same selected angle to the plane of said disc;



3. a converging section having opposed converging sidewalls, each connected to a said diverging sidewall, the converging sidewall converging at the same selected angle to the plane of said disc; and

4. a circular section each end of which is tangent to and connecting with said converging sidewall, said sealing member being received in said generally dovetailed shaped groove and extending partially outwardly beyond said groove to sealably engage said circumferential seal when the plane of said disc is aligned with said circumferential seat.

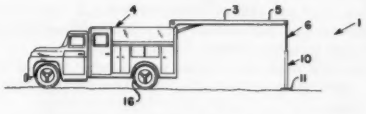
3,910,556
GROUND ROD DRIVING DEVICE

Ray E. Tiede, Rural Rte. 1, Box 180, Great Bend, Kans. 67530

Filed June 10, 1974, Ser. No. 477,684

Int. Cl.² E21B *19/00*

U.S. Cl. 254—29 R **4 Claims**



1. A ground rod driving apparatus for use with a mobile unit having a pivoted elongate boom with a free end and power means for swinging said boom to move said free end above and below a horizontal line, said driving apparatus comprising:

a. a driving member having a head portion and an elongate portion depending from said head portion, said elongate portion having a lower end and a ground rod receiving bore open at said lower end and extending longitudinally of said elongate portion substantially to said head portion, said head being pivotally connected to the free end of the boom whereby said elongate portion depends therefrom;

b. a guide member having a base adapted to rest on a ground surface and an upright guide portion having an open upper end and a lower end fixed to said base, said guide portion having a guide passage longitudinally thereof for reciprocably receiving said elongate portion of the drive member;

c. said base having a rod guiding aperture therethrough substantially axially of said guide passage;

d. said elongate portion of the drive member having a plurality of longitudinally spaced apart apertures extending transversely thereof and intersecting said rod receiving bore;

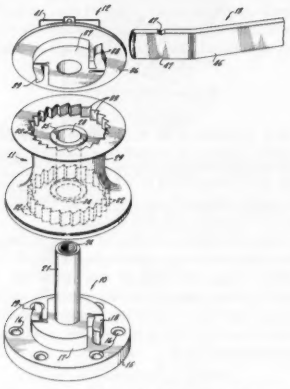
e. an abutment member removably mounted in selected transverse apertures for engaging an upper end of a ground rod positioned in the bore and extending through the guiding aperture in said base portion for driving the ground rod in response to downward movement of the boom.

3,910,557

SYNTHETIC RESIN RATCHET WINCH

Franklin Merriman, 524 DeAnza Dr., Corona del Mar, Calif. 92625

Filed June 7, 1973, Ser. No. 367,774
Int. Cl.[2] B67D *1/74*
U.S. Cl. 254—150 R **9 Claims**



1. A ratchet winch formed primarily of synthetic resin, which comprises:

a. a synthetic resin base adapted to be anchored on the deck of a boat,

b. a metal post the lower end portion of which is embedded in said base, said post having thread means at the upper end thereof,

c. a synthetic resin drum rotatably mounted on said post in the absence of bearings therebetween,

d. first pawl and ratchet means to associate said drum with said base in such manner that said drum may only rotate in one direction relative to said base,

said first pawl and ratchet means being formed of synthetic resin and including pawl means integral with said base,

e. a synthetic resin cap rotatably mounted on said post over said drum,

f. a screw extended through said cap and threaded said thread means to hold said cap on said drum,

g. second pawl and ratchet means to associate said cap with said drum in such manner that said cap may only rotate in one direction relative to said drum,

said second pawl and ratchet means being formed of synthetic resin and including pawl means integral with said cap, and

h. crank means removably mounted on said cap to permit manual driving thereof.

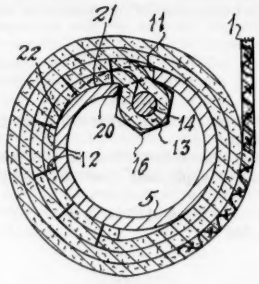
3,910,558

HEAVY DUTY WINCH FOR CARGO TIE-DOWN

Henry J. Brucker, Summit, and Robert J. Brucker, Basking Ridge, both of N.J., assignors to Kinedyne Corporation, Mountainside, N.J.

Filed Feb. 13, 1974, Ser. No. 442,114
Int. Cl.[2] B66F *19/00*
U.S. Cl. 254—164 **2 Claims**

1. A winch for winding a strap comprising the combination of a frame, a winding drum having a tubular wall journaled to rotate in said frame, and means for rotating said drum, said wall having a cylindrical outer surface for winding such a strap thereon and having intermediate its ends a longitudinal slot extending radially therethrough providing for passage of said strap radially through said slot, the longitudinal edge of the



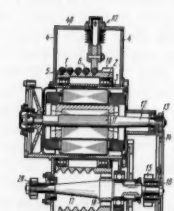
slot over which said strap is drawn during winding of the strap being disposed inwardly of said cylindrical outer surface and there being an exterior curved surface extending convexly from said edge of the slot eccentric to and gradually merging into said cylindrical surface thereby to reduce the possibility of fraying of the strap by said edge of the slot.

3,910,559

ARRANGEMENT FOR HOISTING LOAD

Zinovy Avramovich Sapozhnikov, ulitsa Lenina 88, kv. [illegible]; Iosif Lvovich Fridman, Bulvar Druzhbynarodov, 92, kv. 32, and Moisei Zalmanovich Fridman, ulitsa Shlikhtera 6, kv. 13, all of Kiev, U.S.S.R.

Filed Oct. 10, 1973, Ser. No. 404,912
Int. Cl.[2] B66D *1/26*
U.S. Cl. 254—184 **9 Claims**



1. An arrangement for hoisting a load comprising: two axles disposed parallel one to the other; end plates with said axles immovably secured thereto; two main drums mounted on said axles by means of bearings, said two drums being adapted for rotation and provided with annular grooves in their external cylindrical faces to accommodate a load-carrying rope; means for imparting rotation to said two drums; a length of said rope passing many times around both said drums; and at least one roller disposed in permanent resilient contact with at least one

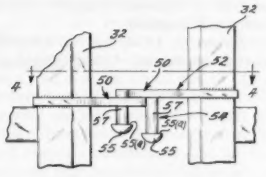
of the falls of said length of rope and acted upon by a force to hold down said length of rope to one of said two drums, said force being sufficient to keep the rope from slipping over the drums when these hoist a load in rotation and to relieve of tensioning that end of the fall which is held down and hangs from a drum, a housing; a fork-end rod disposed in said housing with provision for movement therein; a roller secured to the end of said fork-end rod; a spring fitted on said fork-end rod and exerting a force on said roller so as to hold down the rope to one of the drums; and an equalizer arm secured to said fork-end rod and carrying rollers acted upon by a force exerted by a spring fitted on said fork-end rod.

3,910,560

COUPLING MEANS FOR PORTABLE FENCING AND THE LIKE

Harold E. Goetz, 1003 Ave. F, Dodge City, Kans. 67801

Filed Feb. 21, 1974, Ser. No. 444,529
Int. Cl.² E04H *17/14*
U.S. Cl. 256—24 **12 Claims**



1. A first coupling unit adapted for releasable engagement with a second coupling unit for coupling together two relatively movable rigid structures, said first unit comprising a female portion having spaced sides forming a slot with relatively wide and narrow areas and a male portion having a shank extending from said female portion and an enlarged head on the end of the shank; the second coupling unit having at least one of said female and male portions of said first coupling unit, and said first and second coupling units being adapted to be releasably coupled together with the male portion shank of one of said units being receivable into the wide area of the female portion of the other of said units for seating engagement in the narrower area of the female portion of the other unit.

3,910,561

DISSASSEMBLABLE FENCE MADE OF PLASTICS MATERIAL

Gilbert P. Fornells, 38 rue Stendhal, 75020 Paris, France

Filed Apr. 3, 1974, Ser. No. 457,498
Claims priority, application France, Apr. 4, 1973, 73.12197
Int. Cl.² E04H *17/14*
U.S. Cl. 256—65 **3 Claims**

1. An assembly for the construction of a fence comprising, a plurality of posts adapted to be mounted in a generally vertical position with respect to a ground surface, each of said posts having a longitudinal groove extending along one surface thereof and said grooves each having a bottom formed interiorly of said post, a pair of sides extending outwardly from said bottom and an outer panel formed of a pair of abutment edges extending from said sides toward one another to form a slot therebetween narrower than the space between said sides,

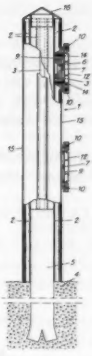
a bracket slidably received in said groove and having a width greater than the width of said slot,

a pin extending outwardly from said bracket through said slot,

a connecting element having an aperture formed therein and said aperture receiving said pin, said connecting element formed with first and second arcuate openings, respectively, on either side of said aperture,

rail-engaging means on that side of said connecting element remote from its post,

first and second releasable fastening means extending, respectively, through said arcuate openings, through said bracket, and into said bottom surface,



an elongated rail member extending between said posts and formed with second means interengaging with said rail-engaging means of said connecting element,

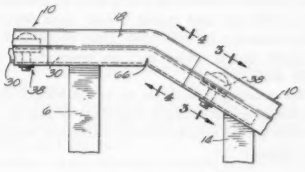
whereby prior to tightening said fastening means, said connecting element can be longitudinally located with respect to its post by sliding said bracket in said groove and angularly located by pivoting about said pin.

3,910,562

WROUGHT IRON RAILING

Arlen Helterbrand, Assumption, Ill., assignor to A-T-O Inc., Willoughby, Ohio

Filed Feb. 18, 1975, Ser. No. 550,813
Int. Cl.² E04H *17/14*
U.S. Cl. 256—65 **9 Claims**



1. In a wrought iron railing assembly comprising a rail element of a modified U-shaped cross-sectional construction adapted to be connected with a post or other support through means of male-type connector elements extending from such post to within arcuately shaped recesses formed in the opposed side leg portions of said rail element, the improvement of an inwardly extending edge on each of the opposed side leg portions of said rail element, said edges disposed in inboard relation with the recesses formed in said side legs, and a clip for assembly to the rail element following the receipt therein of the male-type connector elements, said clip comprising a first plate mounted within the rail element above and in bridging relation to the end portions of the male-type connector elements which are received therein, a second plate adapted to be received along the underside of the rail element in engaging relation with said inwardly extending extensions, said

plate being located directly opposite said first plate, and a nut and bolt means for connecting said first and second plates, including a bolt adapted to be inserted through apertured portions provided within said plates and a nut threadably engageable with one end of the bolt and operative when drawn up on said bolt to draw the plates relatively toward one another to place the portions of said rail element which are in receipt of said male-type connector elements in tension against said elements.

3,910,563

APPARATUS FOR MIXING, SEPARATING OR SORTING DRY SUBSTANCES OR ARTICLES

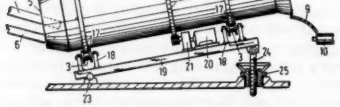
Bastiaan Vissers, Glipperdreef 196, Heemstede, and Willem Teunissen, Ruischenstein 22, Amstelveen, both of Netherlands

Filed Nov. 2, 1973, Ser. No. 412,409

Claims priority, application Netherlands, Nov. 3, 1972, 7214934

Int. Cl.[2] B01F *9/06*

U.S. Cl. 259—3 **7 Claims**



1. Apparatus for treating dry materials comprising the combination of:

an elongate, generally horizontal drum having an inlet end of diverging cross section to define a material-receiving space, and having an outlet end defining an outlet throat of selected diameter, said drum being mounted such that the lowest point of said outlet throat is higher than said material-receiving space whereby dry material disposed in said material-receiving space must be elevated in order to pass through said outlet throat, said drum having a section between its inlet and outlet ends, and leading to said outlet throat, which inclines upwardly to said outlet throat; and

means for rotating said drum about its longitudinal axis at a rotational speed causing migration of said dry materials upwardly within said section of the drum to pass out said outlet throat.

3,910,564

STRUCTURE FOR FOUNDRY SLURRY VISCOSITY REDUCTION

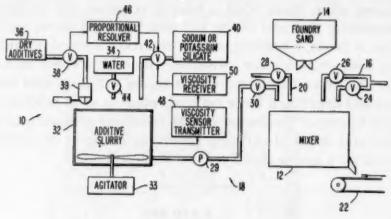
Alexander L. Graham, Livonia, and Robert L. Cleland, Albion, both of Mich., assignors to Harry W. Dietert Co., Detroit, Mich.

Filed Apr. 17, 1972, Ser. No. 244,420

Int. Cl.[2] B28C *7/04*

U.S. Cl. 259—154 **9 Claims**

1. Structure for producing foundry sand additive slurry comprising an additive slurry tank, means operably associated with the slurry tank for first adding water to the slurry tank, means operably associated with the slurry tank for determining the amount of a viscosity reducing agent to be initially added to the water in the additive slurry tank as a proportion of dry additive to be added to the water in the additive slurry tank, means for then metering the viscosity reducing agent



into the water in the additive slurry tank, and means for feeding the amount of dry additives into the additive slurry tank.

3,910,565

SHOCK ABSORBERS

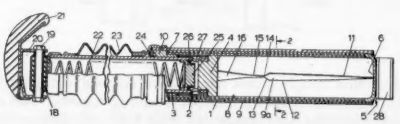
Gunter Persicke, Dartford, and James Richard Child, Wooton-under-Edge, both of England, assignors to Road Research Limited, Gravesend, England

Filed Mar. 13, 1974, Ser. No. 450,906

Claims priority, application United Kingdom, Mar. 19, 1973, 13086/73

Int. Cl.[2] F16F *9/18*

U.S. Cl. 267—116 **12 Claims**



1. A shock absorber comprising a cylinder element, a liner arrangement disposed within said cylinder element, a piston element within said liner arrangement and moveable longitudinally therein, at least one zone 9*a* of weakness longitudinally disposed within said liner arrangement and yieldable at a predetermined pressure, and a fluid in shock absorbing relationship within said cylinder element and liner arrangement such that on the application of the force of shock on at least one of said piston and cylinder elements said elements will be relatively displaced and at said predetermined pressure said zone will yield to permit fluid to flow past said piston to permit variation in the rate of absorption of said force.

3,910,566

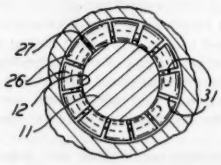
COIL SPRING DETENT ASSEMBLY

Carl O. Pedersen, and Donald J. Parquet, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed May 15, 1974, Ser. No. 470,124

Int. Cl.[2] F16F *1/12*

U.S. Cl. 267—167 **7 Claims**



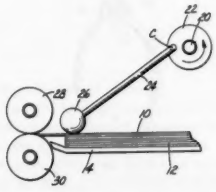
1. A coil spring detent assembly comprising a first member having a cylindrically-shaped wall extending thereon and defining a cylindrical opening in said first member, said first

member having oppositely faced circular walls defining an endless circular first groove in said cylindrically-shaped wall and encircling said cylindrical opening, a cylindrically-shaped second member extending snugly into said cylindrical opening and having oppositely-faced circular walls defining a circular second groove extending endlessly around said second member and having an outer diameter the size of the inner diameter of said first groove for matching alignment of said grooves together on the same plane and form one enclosed annular opening, said members being movable relative to each other for movement of said grooves to positions into and out of alignment with each other relative to the plane along each of said grooves, a plurality of non-elastic, rigid circular members disposed in end-to-end arrangement in said second groove and extending into said first groove for restricting said movement of said first and said second members relative to each other by abutting the said walls defining the respective said grooves, said circular members having holes extending therethrough in the direction of their end-to-end alignment, and a coil spring of a single circular loop of spring material, and with said coil spring being of a coil diametrical size and resilience to be disposed radially inwardly to a position of abutting the said circular members at their interior portions which define said holes in said circular members and to thereby be eccentric relative to said circular members and yieldingly urge said circular members into said second groove and with said coil spring having opposite ends disposed adjacent each other in a closed position, the cross-sectional size of said holes of said circular members being at least twice the cross-sectional size of said coil spring and the cross-sectional size of said circular members being at least twice the dimension of the fully seated depth of said circular members in said second groove for projection of more than one-half of the circular configuration of said circular members from said second groove for reliable release of said circular members from said second groove and to assure said relative movement of said first and said second members and of said circular members relative to each other and relative to said coil spring, and said coil spring and said circular members being respectively dimensioned and arranged to have said circular members in end-to-end abutting disposition to limit radially inward collapse of said detent when said second member is removed therefrom and with the outer diameter of the collapsed said circular members being greater than the inner diameter of said first groove to thereby always remain in said first groove.

3,910,567
SHEET MATERIAL FEEDER

Larry A. Songer, Schaumburg, Ill., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Nov. 5, 1973, Ser. No. 412,533
Int. Cl.² B65H *3/36*
U.S. Cl. 271—42 **5 Claims**



1. A sheet material feeding device for advancing a top sheet from a stack of sheets, comprising:

a driver member supported for rotation about an axis transverse to the direction of movement of the sheet at a position spaced above the stack of sheets;

an elongate feed member connected at one end eccentrically to the driver member solely by a pivotal connection and extending downwardly and forwardly from the driver member in the direction of feed of the sheet to normally rest at its other end by gravity upon the top surface of the sheet at a point substantially displaced from a point beneath the driver member axis;

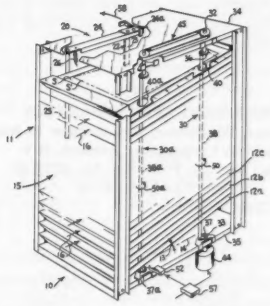
said feed member being movable through a forward feed stroke and a rearward return stroke and including at said other end a frictional element for advancing the top sheet from the stack; and

means for rotating the driver member at a velocity sufficient to impart to the frictional element a partially constrained orbital motion having a reciprocatory component along the plane of the top of the stack of sheets for moving the frictional element into engagement with the top sheet during the forward stroke of the feed member and for moving the frictional element out of engagement with the top sheet during substantially the complete rearward stroke of the feed member in each revolution of the driver member.

3,910,568
JOGGER FOR PLURAL BIN RECEIVER

Michael A. Brown, Norwalk, and Frank R. Chiapetta, Stamford, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Feb. 8, 1974, Ser. No. 440,721
Int. Cl.² B65H *31/38*
U.S. Cl. 271—221 **3 Claims**



1. A collating machine: comprising

a frame;

a plurality of vertically spaced sheet receiving bins carried by said frame;

each of said bins having a sheet receiving end, and each being inclined upwardly and rearwardly from said sheet receiving end thereof;

a longitudinal sheet abutment means positioned along the said sheet receiving end of each of said bins;

a common lateral sheet abutment means carried by said frame and extending substantially vertically along one side of each of said bins, said lateral sheet abutment means being pivotably biased about a pivot for movement towards and away from said side of said bins to allow for easy access to each bin;

said lateral and longitudinal abutment means respectively normally defining lateral and longitudinal limits for movements of sheets in said bins;

said bins having a series of aligned apertures formed therein;

a common crank rod extending through said apertures so as to be capable of engaging the edges of sheets in said bins; means mounting said crank rod for orbital movement in said aperture so as to be capable of engaging and urging sheets in said bins towards said longitudinal and lateral

sheet abutment means and thereby into mutual registry; and

drive means for operating said crank rod.

3,910,569

PRINTING MACHINES

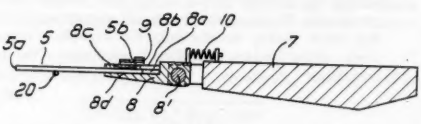
Sylve Jack Donald Ericsson, Branta Backen 17^III, 147 00 Tumba, Sweden

Filed July 25, 1974, Ser. No. 491,955

Claims priority, application Sweden, Aug. 13, 1973, 7311028

Int. Cl.[2] B65H *9/04*

U.S. Cl. 271—244 **9 Claims**



1. A printing apparatus in which the leading edge of a sheet to be printed upon is allotted a first position relative to a printing surface, from which position the sheet is arranged to be moved slightly rearwardly by a first abutment means to a second position or a register postion relative to said surface, wherein said leading edge is arranged to be held against said surface by one or more holding-down means having free ends which are arranged to register with or to extend beyond the leading edge of the sheet when said sheet is located in said first position, and wherein said abutment means is arranged to move the holding-down means and the leading edge of said sheet to said register position.

3,910,570

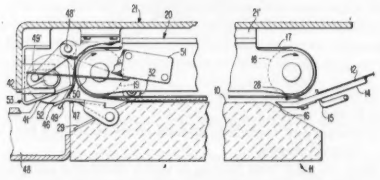
DOCUMENT FEED APPARATUS

Charles D. Bleau, Winchester, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,780

Int. Cl.[2] B65H *9/04*

U.S. Cl. 271—245 **12 Claims**



1. A document feeding apparatus including:

belt means for feeding a document along a predetermined path;

rotating means disposed adjacent the axit end of said belt means and cooperating with said belt means to cause the document to continue to follow the predetermined path when said belt means ends, said rotating means rotating in the same rotary direction as the engaging portion of said belt means to feed the document along the predetermined path;

said rotating means having a peripheral speed at least equal to the peripheral speed of said belt means;

and means engaging said rotating means to form a nip therebetween along the predetermined path beyond the exit end of said belt means to enable said rotating means to create a driving force on the document to advance the document from said belt means along the predetermined path.

3,910,571

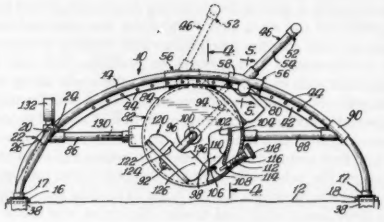
THERAPY CYCLE

Harriett M. Stenn, 5738 S. Talman, Chicago, Ill. 60629

Filed Apr. 15, 1974, Ser. No. 460,727

Int. Cl.[2] A63B *23/04, 69/16*

U.S. Cl. 272—58 **7 Claims**



1. A cycle-type exercising device for attachment to a horizontal surface and having an arcuate shaped frame member, a pair of elongate pads connected at their midpoints to the opposite ends of said frame member, strap means fastened to said pads for attaching said exercising device to a horizontal surface, a drum-shaped housing carried by the midportion of said frame member, a crank means mounted on the housing and having pedal supports projecting outwardly from the opposite sides thereof, foot engaging members pivotally carried by said pedal supports, energy absorbing means mounted in said housing and being attached to said crank means, means connected to said energy absorbing means for varying the amount of energy expended by said energy absorbing means as said pedal means drives said energy absorbing means, a handlebar connected to said frame member, means for adjusting said handlebar in any one of a plurality of positions on said frame member, said means for adjusting said handlebar comprising a flange member projecting radially from said frame member and a U-shaped means carried by said handlebar and straddling said frame member and said flange member and means coacting between said U-shaped means and said flange member to lock said handlebar in any one of a plurality of locations along said frame member.

3,910,572

HAND EXERCISER WITH ADJUSTABLE VALVE

Harry Kirk Denler, Detroit, Mich., assignor to Grip-It, Inc., Detroit, Mich.

Filed Nov. 29, 1973, Ser. No. 419,961

Int. Cl.[2] A63B *21/30;* **F16K** *24/04;* **G05D** *7/01*

U.S. Cl. 272—68 **1 Claim**

1. A hand exerciser comprising a flexible, compressible, hollow bulb of a size such that it can be conveniently held in the hand and squeezed from a normally expanded to a collapsed condition, said bulb having a neck at one end defining an elongated passage to the interior of said bulb, the interior of said bulb having a shoulder at the inner end of said passage, a bleed valve for said passage, said valve being of a material

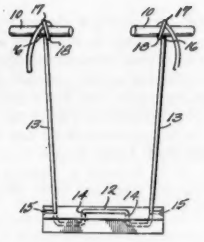
having greater resistance to compression than the material of said bulb, said valve having a head at one end and an elongated shank extending from said head, said shank having an enlargement at the end thereof opposite said head, said head and said enlargement being of larger cross-dimension than said passage, said shank between said head and said enlargement being of greater length than said passage and extending lengthwise into said passage, said shank having an elongated slot in one side extending lengthwise of said shank, a portion of said slot extending through said enlargement, said slot being of greater length than said passage, said slot and the adjacent wall of said passage defining a restricted duct for air expelled from said bulb when squeezed, said shank being externally threaded over at least a portion of its length, said slot being of gradually diminishing depth throughout a major portion of its length in a direction toward said head and cutting across said externally threaded portion, said externally threaded portion of said shank engaging said passage and serving to axially adjust said shank with respect to said passage upon rotation of said valve, thereby to vary the effective size of said air duct depending upon the position of said slot with respect to the outer end of said passage and accordingly control the rate at which air is expelled from said bulb when squeezed, said valve being adjustable by rotation to an outer limiting position in which said enlargement engages said shoulder, said portion of said slot extending through said enlargement maintaining communication with the interior of said bulb when said valve is at said outer limiting position.

3,910,573

FOUR PIECE ISOMETRIC EXERCISER

Michael Jamba, Star, Rte., Stamford, N.Y. 12167

Filed Sept. 3, 1974, Ser. No. 502,838
Int. Cl.² A63B *21/00*
U.S. Cl. 272—79 R **3 Claims**



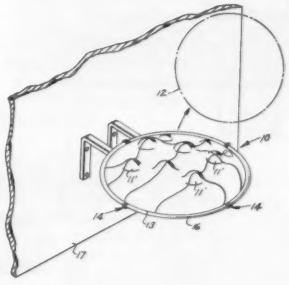
1. An exercising device comprising:
an elongated footrest having a central and two end portions, said footrest having a pair of openings in its central portion, said openings being spaced apart a distance sufficient to accommodate one foot of a user therebetween, said footrest having a pair of slots, one in each of its end portions, said slots extending inwardly from the outermost portion of said end portions towards said openings, the innermost extreme of said slots being spaced apart a distance sufficient to accommodate both feet of a user therebetween,
a rope having two end portions and a bight portion positioned between said openings, and
a hand grip secured to each end portion of said rope.

3,910,574

BASKETBALL REBOUND DOME

Bradford H. Voltz, Erie, Pa., and Kenneth E. Hayden, Avon, Ohio, assignors to Kenneth E. Hayden, Avon, Ohio

Continuation-in-part of Ser. No. 818,572, April 23, 1969, Pat. No. 3,795,401. This application Feb. 7, 1974, Ser. No. 440,379
Int. Cl.² A63B *63/00*
U.S. Cl. 273—1.5 A **10 Claims**



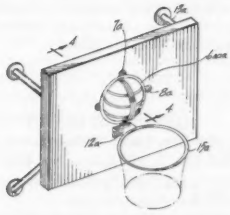
1. A basketball rebound dome device for detachable securement to the top of a basketball hoop comprising an upwardly convex surface member having at least one raised protuberance thereon causing erratic bouncing of a basketball striking thereagainst, and means for detachably securing the convex surface member to the top of an associated basketball hoop, said at least one protuberance comprising a three-sided pyramid with a triangular base.

3,910,575

BASKET BALL TARGET BOUNCE-AWAY DEVICE

Edwin H. Miller, Box No. 199, R.F.D. No. 4, Lakewood Road, Freehold, N.J. 07728

Filed Mar. 11, 1974, Ser. No. 450,059The portion of the term of this patent subsequent to Jan. 23, 1985, has been disclaimed.
Int. Cl.² A63B *63/00, 69/00*
U.S. Cl. 273—1.5 A **2 Claims**

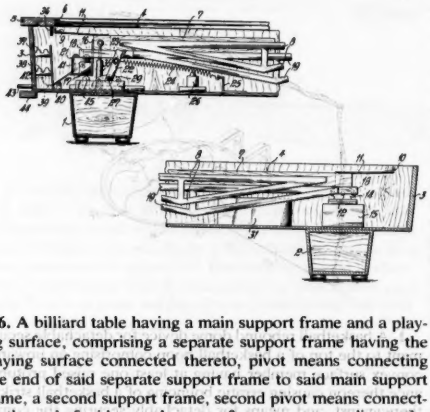


1. A basketball backboard rebound device comprising in combination: angular projection-shaped substantially firm and resilient means for resisting a substantial amount of recoil within a predetermined range when struck with force-blows by an impelled basketball, and mounting means having at least two securing elements located at diametrically opposite edges of a diameter of the respective shaped resilient means, said resilient means being substantially hemispherically shaped and having a plurality of flexed ribs and flexed cross-supports therefor.

3,910,576
BILLIARD TABLE WITH PIVOTABLY MOUNTED PLAYING SURFACE SUPPORT FRAME

Xaver Leonhart, 8381 Harburg near Pilsting, North Bavaria, Germany

Filed Aug. 1, 1974, Ser. No. 493,988
Claims priority, application Germany, Sept. 10, 1973, 2345617
Int. Cl.² A63D 15/00
U.S. Cl. 273—3 C 6 Claims



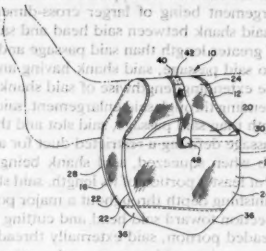
6. A billiard table having a main support frame and a playing surface, comprising a separate support frame having the playing surface connected thereto, pivot means connecting one end of said separate support frame to said main support frame, a second support frame, second pivot means connecting the end of said second support frame, corresponding to the pivotally connected end of said separate support frame, to said main support frame, said second support frame and said separate support frame being pivotally movable relative to each other and relative to said main support frame, a lever mechanism connected between said main support frame and said second support frame for raising and lowering the latter, and releasable magnetic coupling means connected between the end of said separate support frame opposite from said one end thereof and the end of said second support frame opposite from said corresponding end thereof, said releasable magnetic coupling means being so connected between the support frames such that lowering said second support frame with said lever mechanism completes the magnetic coupling means between said separate support frame and said second support frame and raising the latter with said lever mechanism pivotally moves said separate support frame and said playing surface through said releasable magnetic coupling means about said pivot means between a lowered inclined non-use position and a raised horizontal use position.

3,910,577
EXERCISING DEVICE

John J. Boyle, 208 Jobs Lane, Williamstown, N.J. 08094

Filed Oct. 2, 1973, Ser. No. 402,870
Int. Cl.² A63B 23/04
U.S. Cl. 272—57 R 10 Claims

10. An exercising device for persons sitting or lying down comprising first and second flexible pouches for receiving weights, a flexible web interconnecting said pouches, a central portion of said web being narrower than said pouches, each of said pouches having at least one opening at one end thereof so that the openings are in generally facing relation to each other when lying flat and so that the openings are accessible at the upper ends of the pouches when the web is directly over a limb, each opening extending across substantially the entire width of its pouch, each of said pouches extending over substantially the entire width of the device and having a depth substantially equal to the width, each pouch having a third dimension which is small relative to said width and depth so as to be capable of securely receiving a circular weight plate,

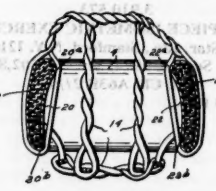


each pouch having generally straight sides connected to a rounded bottom.

3,910,578
LACROSSE STICK

William H. Brine, Jr., 26 Gypsy Trail, Weston, Mass. 02193

Division of Ser. No. 253,061, May 15, 1972, abandoned. This application Feb. 28, 1974, Ser. No. 446,668
Int. Cl.² A63B 59/02
U.S. Cl. 273—96 D 4 Claims

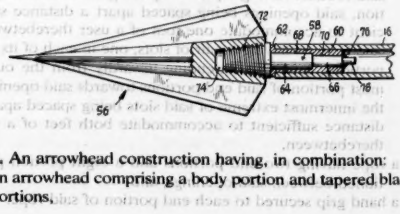


1. A lacrosse stick comprising a closed frame having a throat portion, a handle attached to the frame adjacent to the throat portion, a net supported between the sides of the frame and having a ball-containing pocket extending forwardly of the throat portion of the frame, said frame including a transversely disposed head portion and a pair of side wall portions extending between the head portion of the said throat portion, and each of said side walls being shaped to provide a cross section in the form of an inverted J, thereby to furnish an upper curved ball-trapping edge and lower relatively straight pocket guiding surfaces.

3,910,579
SWIVEL-MOUNTED HUNTING ARROWHEAD

Harold R. Sprandel, 19 Brookside Dr., Monroe, Conn. 06468

Filed June 17, 1974, Ser. No. 480,021
Int. Cl.² F41B 5/02
U.S. Cl. 273—106.5 B 3 Claims



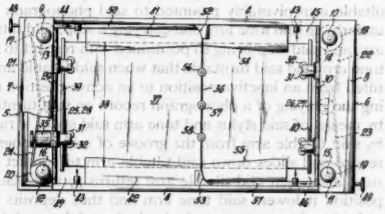
1. An arrowhead construction having, in combination:
a. an arrowhead comprising a body portion and tapered blade portions,

b. means attached to said body portion, for mounting the same on the front end of an arrow shaft to constitute an extension thereof,
c. said mounting means comprising a swivel structure enabling the body and blade portions to have turning movement with respect to, and about the axis of, the arrow shaft,
d. the blade portions of the arrowhead having pointed ends and being disposed around and in coextensive relation to said body portion, and
e. manually operable means on said body portion for releasably clamping said blade portions thereto with their pointed ends foremost,
f. said body portion of the arrowhead comprising a shank coextensive with the blade portions thereof,
g. said clamping means comprising a nut carried by said shank,
h. said shank and nut having cooperable screw threads enabling the nut to be advanced against the blade portions,
i. said nut having a recess at one end, constituting a mouth portion adapted to receive the rear ends of said blade portions to lock the same to the shank,
j. said swivel structure comprising a smooth end portion of the shank and a bushing in which the smooth end portion is turnable,
k. said bushing being adapted for securement in the front end of the arrow shaft.

3,910,580
TABLE BALL GAME WITH MOVEABLE CIRCULAR BUMPER PORTIONS

Xaver Leonhart, 8381 Harburg near Pilsting, Lower Bavaria, Germany

Filed July 30, 1974, Ser. No. 493,130
Claims priority, application Germany, Sept. 10, 1973, 2345558
Int. Cl.² A63D *3/02*
U.S. Cl. 273—119 A **4 Claims**

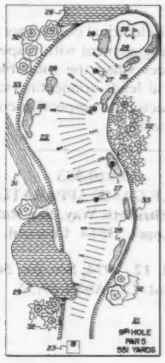


1. A table ball game comprising a playing surface having opposite ends, guide means connected substantially parallel with and adjacent to at least one of said opposite ends of said playing surface, a pair of resilient elements, a circular bumper portion connected to the lower end of each of said resilient elements, common means connected for back and forth movement on said guide means, the circular bumper portions which are connected to the lower ends of said pair of resilient elements being connected through said pair of resilient elements so as to be adjacent each other in side by side relation on said common means and positioned inwardly of the end of the playing surface and presenting a ball rebound surface of greater than 180°, control means connected to said common means to move said pair of resilient elements and circular bumper portions back and forth on said guide means, photocell circuit means connected to said table ball game and adapted to direct a light beam transversely across at least one of the opposite ends of said playing surface parallel with said guide means and positioned in front of the pair of circular bumper portions, and an electromagnet connected to the pair of circular bumper portions and with said photocell circuit means, said electromagnet providing means for moving said circular bumper portions forwardly when the light beam is momentarily interrupted, at least one game ball to be projected by said circular bumper portions, said circular bumper portions being spaced sufficiently close together to project said ball when positioned between the pair of circular bumper portions longitudinally of said playing surface when said circular bumper portions are moved forwardly by the action of said photocell circuit means and said electromagnet, and said circular bumper portions when so moved further being so shaped and positioned as to project said ball when contacting the circular bumper portions off center thereof to various directions on the playing surface within a rebound angle of at least 180°.

3,910,581
GOLF GAME BOARD APPARATUS

Murray T. Nicholson, 4086 Apore St., La Mesa, Calif. 92041

Filed Nov. 7, 1974, Ser. No. 521,559
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 CG **3 Claims**



1. A golf game apparatus comprising:
a plurality of cards, each of said plurality of cards having at least one simulated golf fairway on at least one surface thereof;
each of said at least one fairway having a simulated green area therein and a tee;
a plurality of marks spaced along each of said fairways for designating simulated distances from the tee;
a first chance control device for determining the length of a drive from a tee;
a second chance control device for determining the character of said drive; and
a third chance control device for determining the number of putts on a green, said third chance control device consisting of a spinner card indicating distance on the green from the hole and a plurality of dice, each of said plurality of dice having a unique number combination.

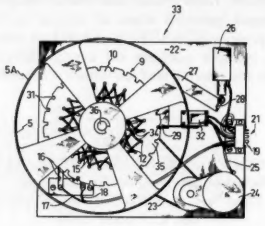
3,910,582
REPLACEABLE PLUG-IN REEL MODULE FOR GAME MACHINES

Basil James Richards, Double Bay, Australia, assignor to New Century Novelty Company Pty. Limited, Rushcutters Bay, Australia

Filed Aug. 2, 1973, Ser. No. 384,975
Claims priority, application Australia, Nov. 1, 1972, 1054/72
Int. Cl.² A63F *5/04*
U.S. Cl. 273—143 R **4 Claims**

1. A detachable symbol-display drum assembly module comprising a detachable mounting frame, a plug-in electrical connector including one part fixed on the frame, a display drum rotatably supported on said frame and displaying a

plurality of different symbols, an individual electric driving motor for the display drum also supported on said frame, an electrically insulating disc fixed to said display drum, two concentric circles of contact faces carried by said disc, different valued electrical resistors connected between said two circles of contact faces, each value corresponding to its associ-



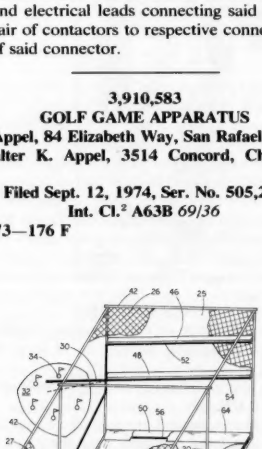
ated symbol, a pair of electrical contactors supported on said mounting frame for engagement with respective ones of said circles of contact faces when the rotatable display drum is indexed, and electrical leads connecting said electric motor and said pair of contactors to respective connections on said one part of said connector.

3,910,583

GOLF GAME APPARATUS

Peter W. Appel, 84 Elizabeth Way, San Rafael, Calif. 94901, and Walter K. Appel, 3514 Concord, Cheyenne, Wyo. 82001

Filed Sept. 12, 1974, Ser. No. 505,264
Int. Cl.² A63B *69/36*
U.S. Cl. 273—176 F **9 Claims**



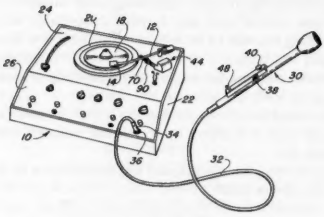
1. A golf game apparatus comprising:
a tee area from which a ball may be propelled;
a generally vertical, flexible sheet opposite said tee area adapted to yieldably brake a ball projected against it;
a receptacle extending across said sheet to receive a ball dropping along the surface of said sheet;
a putting green area where a subsequent golf shot may be played;
means including a first conveyor tube to deliver balls from said receptacle to said putting green; and
a plurality of delivery openings spaced axially and angularly along said conveyor tube large enough to enable a ball to pass therethrough; and
means for propelling a ball through said conveyor tube along a spiral path.

3,910,584

REMOTE CONTROL APPARATUS FOR PHONOGRAPHS

James C. Hilton, 1033-E Shary Circle, Concord, Calif. 94518

Filed Oct. 23, 1973, Ser. No. 408,499
Int. Cl.² G11B *17/06*
U.S. Cl. 274—14 **1 Claim**

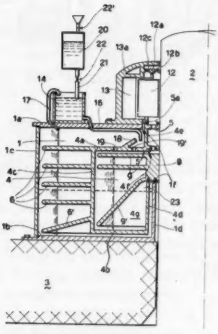


1. A combined phonograph and public address system including a turntable, a tone arm having a stylus, and a microphone interconnected with the public address system by a flexible cable, wherein the improvement comprises:
a tiltable arm pivotably mounted to said phonograph and underlying said tone arm and carrying a stop, said tiltable arm and said stop being so positioned with respect to said tone arm and said turntable that when said tiltable arm is tilted from an inactive position to an active position during the playing of a phonograph record on said turntable by means of said stylus and tone arm said stylus is raised by said tiltable arm from the groove of said phonograph record and slides down said tiltable arm to contact said stop, and when said tiltable arm returns to said inactive position it lowers said tone arm and thus deposits said stylus in said groove near the beginning of the modulated portion thereof, the entire path followed by the stylus while the tone arm is in contact with said tiltable arm overlying said record;
tilting means for tilting said tiltable arm from said inactive position to said active position and back to said inactive position when rotated;
electric motor means for rotating said tilting means;
switch operating means driven by said electric motor means;
power supply means for supplying power to said electric motor means;
first and second branch circuits each connected in series with said electric motor means and said power supply means;
a first switch in said first branch circuit operated by said switch operating means;
a second switch in said second branch circuit operated by said switch operating means;
relay means alternatively closing said first branch circuit when energized and closing said second branch circuit when de-energized; and
manually operable remote control switch means located at said microphone for energizing and de-energizing said relay means.

3,910,585
HYDRAULIC MULTICELLULAR SEALING DEVICE FOR CENTRIFUGAL PUMPS

Giuseppe Tabacchi, Bologna, Italy, assignor to Comitato Nazionale Per L'Energia Nucleare & Chen, Rome, Italy

Filed Oct. 29, 1973, Ser. No. 410,358
Claims priority, application Italy, Nov. 7, 1972, 53847/72
Int. Cl. F16j *15/40*
U.S. Cl. 277—14 **6 Claims**



1. A sealing device of the centrifugal multicellular type for preventing any leakage of fluid around a vertical rotatable shaft where it passes through a wall by which two spaces at different pressures are separated, which device comprises:

a first stationary annular chamber coaxial with said shaft, which chamber in vertical radial cross-section has the shape of a C with the C opening directed toward the shaft;

a second annular chamber within the first one and coaxial with said shaft which chamber has also the shape of a C in vertical radial cross section with the C opening directed toward said shaft the openings of the two chambers being made to coincide at least partially, said second chamber being surrounded by the first chamber and rot-atably mounted with respect thereto and coupled to a motor for being rotated thereby;

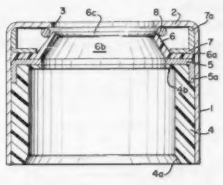
a hub tightly mounted on a shaft and provided with a series of circular fins vertically spaced which project outward from the shaft and pass through said two corresponding openings of said chambers into the inside of the said second chamber to nearly touch the wall thereof opposite to the chamber opening; said second chamber being provided on its surface facing outward with respect to said shaft with a series of vertically spaced circular fins which project outwards to nearly touch the inner surface of the outer wall of the first chamber; said chambers being partially filled with sealing fluid; one of the two spaces which are separated by said wall through which said shaft passes being open into the space underlying the lowest fin in both chambers while the other space communicates with the space within both said chambers above the highest of the respective fins.

3,910,586
PACKING FOR VALVE STEMS USED IN INTERNAL COMBUSTION ENGINES

Salvador Todaro, Buenos Aires, Argentina, assignor to Salvador Todaro Y Hermano, Argentina

Filed Jan. 4, 1974, Ser. No. 430,882
Claims priority, application Argentina, Jan. 10, 1973, 246080
Int. Cl.² F16J *15/00*
U.S. Cl. 277—48 **4 Claims**

1. A packing for valve stems used in internal combustion engines, comprising a substantially cylindrical rigid casing having a fully opened entrance end and an opposite end with an internal flange having a central opening of a diameter slightly larger than the valve stem diameter, a tubular lining of elastic material located within and coextensive said casing and having a bore with an outwardly flared bevel at an end thereof adjacent the entrance end of said casing and an opposite end with an inwardly extending flange, an elastomeric bell-shaped annular gasket having a radially extending outer flange overlying said lining flange and an inner frusto-conical wall portion extending inwardly from said outer flange toward the central opening and having an opening in a relaxed state substantially

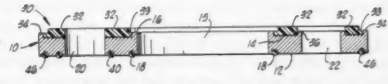


of the same diameter as the diameter of the valve stem and slightly smaller than the central opening of said casing, a first washer between said gasket flange and said lining flange, a second washer spaced from said casing flange and located in juxtaposition with said gasket flange, holding means between said casing flange and said second washer for holding said second washer against said gasket flange to hold said gasket flange and said first washer against said liner, and an annular spring disposed between said gasket frusto conical wall portion and said casing flange and reinforcing gasket.

3,910,587
FACE SEAL STRUCTURE

Robert I. Loeffler, Norman, and Lonnie C. Higginbottom, Midwest City, both of Okla., assignors to University Engineers, Inc., Norman, Okla.

Filed Aug. 2, 1974, Ser. No. 494,321
Int. Cl.² F16J *15/34, 15/44*
U.S. Cl. 277—63 **15 Claims**



1. A face seal for sealing between two relatively moving planar faces comprising:

a seal plate having a pair of opposed, parallel, substantially monoplanar sides, and having a plurality of spaced openings therethrough disposed a common radial distance outwardly from a central axis projected perpendicularly to the planes of said sides through the center of said seal plate, said seal plate further having islands positioned between adjacent openings therethrough;

a monoplanar bearing and sealing surface carried on one of said sides of said seal plate and extending parallel to said sides, said bearing and sealing surface surrounding the openings through said seal plate and overlying the islands of said seal plate, that portion of the bearing and sealing surface which overlies said islands being relieved at at least one location over at least one of said islands; and

at least one fluid retaining sealing element secured to the monoplanar side of said seal plate opposite the side thereof carrying said sealing surface, each of said fluid retaining sealing elements extending around, and encompassing, an area on said opposite side, a portion of which area is the area of one of said openings, and other portions of said area being parts of said islands disposed adjacent the opposite

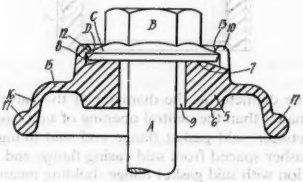
ends of said one opening, said fluid retaining sealing elements and openings being located so that at least one opening not surrounded by, and encompassed within, one of said fluid retaining sealing elements is positioned adjacent, and spaced by one of said islands from, each of said openings which is surrounded by, and encompassed within, one of said fluid retaining sealing elements.

3,910,588

SEALING WASHERS, AND FASTENER-SEALING WASHER ASSEMBLIES

George Alfred Braisby Austin, 3 Prior Road, Nobel Park, Victoria, Australia

Filed May 6, 1974, Ser. No. 467,439
Int. Cl.² F16J *15/10;* **F16B** *29/00*
U.S. Cl. 277—166 **2 Claims**



1. A sealing washer for preassembled association with a fastener having a head and a shank, the washer including a body portion having an upper bearing surface and lower bearing surface, the upper bearing surface including an inclined surface portion extending downwardly and outwardly from the inner peripheral margin thereof, a rim portion extending upwardly from the outer marginal region of the inclined surface portion and adapted to surround the perimeter of the fastener head, the rim portion including inwardly extending flange means with the uppermost edge including means permitting the fastener head to be forced inwardly thereof so that the flange means snaps on top of at least a portion of the head means and thereby retaining the washer beneath the head of the fastener, the rim portion including peripherally spaced slots extending downwardly from the uppermost edge thereof to the inclined surface portion to facilitate drainage of water therefrom, a peripheral skirt portion extending downwardly and outwardly of the body of the washer to sealingly engage a workpiece wherein a joint formed by the fastener with a workpiece is effectively sealed through sealing engagement between the lower bearing surface and the workpiece as well as through sealing engagement between the peripheral skirt portion and the workpiece.

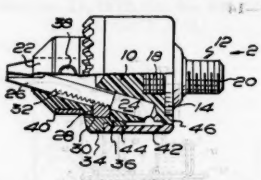
3,910,589

ELECTRICALLY INSULATED DRILL CHUCK FOR PORTABLE ELECTRIC POWER DRILLS

George C. Derbyshire, Sheffield, England, assignor to The Jacobs Manufacturing Co., Ltd., Sheffield, England

Filed Mar. 6, 1974, Ser. No. 448,652
Int. Cl.² B23B *31/04*
U.S. Cl. 279—61 **5 Claims**

1. A drill chuck for an electric power drill having a spindle for driving the chuck, the chuck comprising a body formed of an electrical insulating plastics material, a metal insert keyed into the rear of the body having an axially extending threaded portion for mounting the chuck to the spindle of the drill, the body having a bore extending axially and partway into the front end of the body for reception of a drill shank, three equally spaced slidable jaw tracks formed in the body diverging rearwardly from the bore partway into the body, a slidable shank gripping metal jaw in each track, a metal nut supported upon the body for relative rotation having an internal threaded engagement with the jaws for slidably advancing them and retracting them along the jaw tracks, a metal bevel ring gear fixed around the nut for selectively rotating the nut relative to the jaws to effect advancement and retraction of the jaws, the body having a cylindrical nose portion of reduced diameter extending forwardly of the bevel ring gear, there



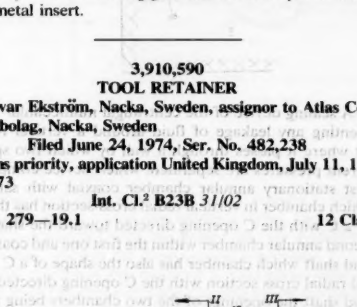
being a radial blind hole in the nose portion adapted for reception of the pilot of a chuck key having a gear cooperable with the bevel ring gear for rotating the latter, and a sleeve of electrical insulating plastics material covering over the body rearwardly of the bevel ring gear and in radial spaced relation to the metal insert.

3,910,590

TOOL RETAINER

Gösta Ivar Ekström, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed June 24, 1974, Ser. No. 482,238
Claims priority, application United Kingdom, July 11, 1973, 33159/73
Int. Cl.² B23B *31/02*
U.S. Cl. 279—19.1 **12 Claims**



1. A tool retainer for retaining a tool having a shank with a collar thereon, comprising:

a sleeve of resilient material having an axial passage therethrough for receiving said tool therein,

a latch movably mounted in the sleeve for retaining the tool in the sleeve, the latch having a working surface for abutting the collar of the tool to retain the tool, the latch being movable between an active position where it projects into the axial passage through the sleeve to retain the tool and an inactive position where it is substantially withdrawn from said axial passage to allow withdrawal of the tool, and

locking means including a resilient sleeve portion normally projecting in the path of movement of said latch for lockingly engaging said latch in the active position by moving said latch past said projecting sleeve portion, said projecting sleeve portion snapping substantially back to its normal projecting position after passage of said latch, thereby locking said latch in said active position.

3,910,591

SAFETY FIXING DEVICE FOR SKI BOOTS

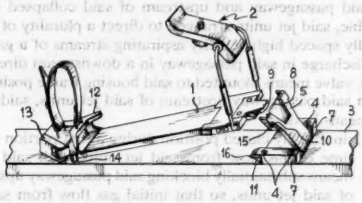
Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France

Filed Aug. 21, 1973, Ser. No. 390,245

Claims priority, application France, Aug. 31, 1972, 72.30914

Int. Cl.² A63C 9/08

U.S. Cl. 280—11.35 K 10 Claims



1. A fixing device for a ski comprising a first holding member and second holding member, said members binding the ends of a boot element to the ski,

said first holding member comprising a bridge member formed in two parts including

- a first portion fixed with respect to the ski,
- a second portion pivoting and moving substantially longitudinally with respect to said first portion;

said second portion being adapted to cooperate,

- on one hand, with one end of the boot element by means of a first system of two ramps, one of said two ramps being rigidly fixed to said second portion and the other being fixed to the boot element,
- on the other hand, with said first portion by means of at least one second system of two ramps, one of said two ramps of said second system being rigidly fixed to said first portion,

at least one of said two ramps of each of said first and second system of two ramps forming an acute angle with respect to the ski,

said acute angles being both open towards said second holding member; said fixing device further comprising,

- a first spring system compressed by the boot and located on at least one of said first and second holding members;

said spring system urging through the boot element said second portion downwards towards the ski by the effect of said second system of two ramps; and

- locking means intercalated between said first and second portions, limiting the amplitude of displacement of said second portion.

3,910,592

FRONT SUPPORT MECHANISM FOR SAFETY SKI BINDING

Brigitte Sittmann, Stuttgart, Germany, assignor to VereinigteBaubeschlagfabriken Gretsch and Co. GmbH, Germany

Filed Nov. 8, 1973, Ser. No. 414,108

Claims priority, application Germany, Nov. 8, 1972, 2254522

Int. Cl.² A63C 9/08

U.S. Cl. 280—11.35 T 75 Claims

1. A ski boot support mechanism for safety ski bindings comprising:

a support structure attachable to a ski surface,

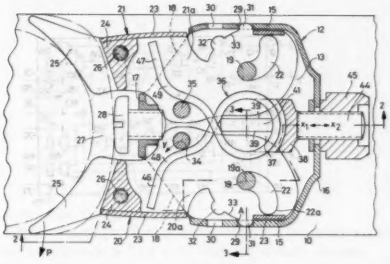
at least one boot sole holding means,

lateral support arm means attached to and movable with each of said boot sole holding means,

pivot support means for supporting each of said lateral support arm means at said support structure for pivotal movement about a support arm pivot axis which extends at least approximately perpendicular to said ski surface, and resilient means for resiliently resisting pivotal movement of said lateral support means,

said pivot support means including roll-off means for accommodating predetermined movement of each of said support arm pivot axes during pivotal movement of said lateral support arm means,

characterized in that said pivot support means includes means for assuring that each of the pivot axes are displaced rearwardly in the course of the outward pivoting stroke of the support arm means.



3,910,593

ARRANGEMENT FOR SECURING A BODY BY MEANS OF AN ADHESIVE BOND

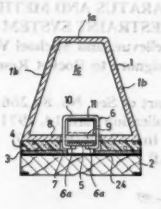
Gunter Schwarz, Pfugstrasse 6, 8006 Zurich, Switzerland

Filed May 28, 1974, Ser. No. 473,883

Claims priority, application Germany, June 1, 1973, 2328084

Int. Cl.² A63C 11/00

U.S. Cl. 280—11.37 E 18 Claims

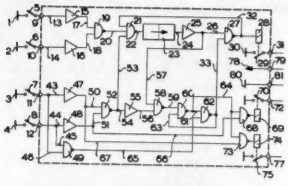


1. An attachment arrangement for securing a body by means of an adhesive bond to an upper surface of a ski, comprising an attachment plate possessing an adhesive surface for connection of the attachment plate to the surface of a ski, said attachment plate being equipped with at least one projection at a side of the attachment plate facing away from the adhesive surface, a locking element contactingly engaging with said projection, said body having a portion which faces the attachment plate, an elastomeric disk substantially corresponding in size to the size of the adhesive surface, said portion of said body and said elastomeric disk being arranged between the attachment plate and the locking element, so that a force acting laterally upon the body compresses the elastomeric disk and is transmitted via the projection to the attachment plate.

3,910,594
CONTROL ARRANGEMENT FOR A SUSPENSION SYSTEM USING A PRESSURE MEDIUM

Knut Joneleit, Iserlohn, Germany, assignor to Hoesch Aktiengesellschaft, Dortmund, Germany

Division of Ser. No. 254,304, May 17, 1972, Pat. No. 3,830,138. This application July 19, 1974, Ser. No. 490,023
Int. Cl.[2] B60G *11/28*
U.S. Cl. 280—124 F **17 Claims**

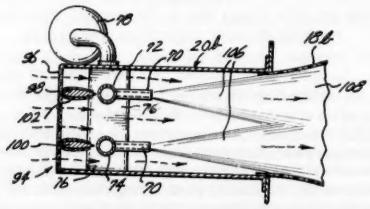


1. In a system including a body of a motor vehicle, an axle of said motor vehicle, and suspension means for suspending said body relative to said axle at a distance varying at least in part as a function of pressure medium in said suspension means, in combination, first signal furnishing means for furnishing a first signal when the distance between said body and said axle is less than a first predetermined distance; delay means connected to said first signal furnishing means, said delay means having input gating means including at least one bistable semiconductor logic circuit, timing circuit means connected to said input gating means for furnishing a predetermined time delay, and output gating means connected to said timing circuit means, said output gating means furnishing a first activating signal after said predetermined time delay following receipt of said first signal; and first activating means connected to said delay means for changing the quantity of said pressure medium in such a manner as to increase said distance between said body and said axle, in response to said first activating signal.

3,910,595
ASPIRATING APPARATUS AND METHOD FOR CRASH RESTRAINT SYSTEM

Lincoln B. Katter, Bellevue, and Michael W. Wells, Kirkland, both of Wash., assignors to Rocket Research Corporation, Redmond, Wash.

Continuation-in-part of Ser. No. 84,266, Oct. 27, 1970, abandoned. This application June 14, 1971, Ser. No. 152,895
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 AB **5 Claims**



1. In a vehicle having an interior within which is an occupant carrying location and having structure spaced from said location, a crash restraint apparatus for protecting an occupant in said location from impact with said structure, said apparatus comprising:

a. a housing frame having lateral wall means defining a through aspirating passageway with an upstream inlet opening and a downstream outlet opening,

b. a collapsed inflatable mounted within said passageway proximate said outlet opening, and arranged to be moved from said passageway and through said outlet opening and inflated by gas flowing from said outlet opening to an inflated position between said passenger location and said structure,

c. a plurality of laterally spaced aspirating jet units mounted to said frame and positioned across substantially all of said passageway and upstream of said collapsed inflatable, said jet units arranged to direct a plurality of laterally spaced high velocity aspirating streams of a gaseous discharge in said passageway in a downstream direction,

d. valve means mounted to said housing frame positioned at said passageway upstream of said jet units, said valve means having:

1. an initially closed position during a first portion of the time of gas flow from said jet units, with said valve means substantially blocking said passageway upstream of said jet units, so that initial gas flow from said jet units into said passageway creates a positive pressure in said passageway sufficient to move said inflatable at a relatively high velocity out through said passageway toward said inflated position, and

2. a subsequent open position during a second portion of the time of gas flow from said jet units to permit an inflow of aspirated air through said passageway inlet opening aspirating action of the high velocity streams of gas from said jet units to make a gas mixture of the aspirating gas and the aspirated air to inflate the inflatable to its protective position,

e. said valve means being a flap type check valve having a closed position generally transverse to said passageway and movable to an open position generally parallel to direction of flow in said passageway in response to pressure reduction downstream in said passageway and movable to its closed position upon pressure increase downstream of said passageway, and

f. said flap valve having at least one support member disposed generally transverse of said passageway and a lateral surface extending downstream, with at least one flexible flap member mounted on said support member, which flap member is movable against the lateral surface of the support member to an open position and away from the lateral surface of the support member to a transverse position to close the passageway.

3,910,596
INFLATION APPARATUS FOR SAFETY DEVICE

Robert M. Wulbrecht, Utica, and Robert J. Bishop, Rochester, both of Mich., assignors to Allied Chemical Corporation, New York, N.Y.

Filed June 1, 1973, Ser. No. 365,906
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—150 AB **10 Claims**

1. Inflation apparatus adapted to be disposed in a vehicle for inflating a bag upon receipt of an electrical current from an impact detecting means responsive to impact of the vehicle, comprising:

a. gas containing means provided with a pressurized gas;

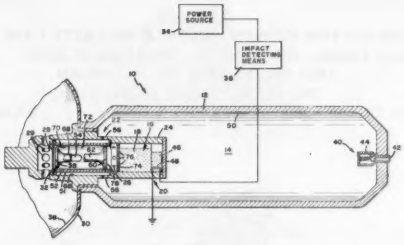
b. gas generating means provided with a gas generating material;

c. actuating means for igniting the gas generating material and upon receipt of the electrical current to form a generated gas;

d. gas releasing means associated with said gas containing means, comprising:

i. housing means containing said gas generating material and having an aperture therein for permitting communication between said gas generating material and said pressurized gas;

ii. outlet means in communication with said pressurized gas and with said inflatable bag, said outlet means being adapted to rupture when the pressure within the gas containing means exceeds a predetermined pressure; and



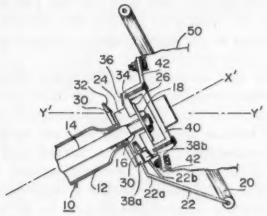
iii. mechanical means disposed in said housing means between said outlet means and said gas generating material for rupturing said outlet means upon ignition of said gas generating material, whereby gas released from the gas containing means and from the gas generating means flows into and inflates the bag.

3,910,597

VEHICLE STEERING COLUMN-STEERING WHEEL ASSEMBLY

Akira Seko, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Dec. 3, 1973, Ser. No. 421,108
Claims priority, application Japan, Dec. 5, 1972, 47-121173
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—150 AB 3 Claims



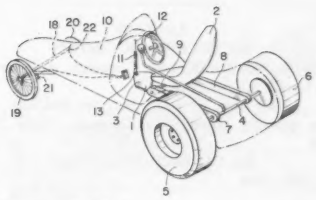
1. A vehicle steering wheel assembly comprising a rotatable steering shaft, a stationary envelope enclosing at least a lower portion of said shaft, a hub fixed to an upper portion of said shaft, a first bevel gear fixed to said envelope adjacent a lower end surface of said hub, a second bevel gear rotatably mounted adjacent an upper end surface of said hub, the diameter and the number of teeth of said first and second bevel gears being equal, at least one pair of bevel piniona in rotational meshing engagement with each other, about respective axes, the diameter and number of teeth of said pinions being equal; one of said pinions being in meshing engagement with said first bevel gear and the other of said pinions being in meshing engagement with said second bevel gear; means for connecting each of said pinions to said hub for rotation about said respective axes: a wheel rim; means connecting said rim to each of said pinions for rotation of said pinions about said respective axes; a mounting element fixed to said second bevel gear; and a driver restraining inflatable restraint device mounted on said mounting element; whereby said mounting element and said restraint device are maintained stationary as said wheel rim, hub and steering shaft are rotated.

3,910,598

TOY CAR

Henry L. Robinson, Berkeley, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Nov. 13, 1974, Ser. No. 523,208
Int. Cl.[2] B62M *1/08*
U.S. Cl. 280—226 R 2 Claims



1. A toy car, comprising

a platform having a seat mounted thereon for accommodating a child and a foot rest; one-way clutch means;

a rear axle having a pair of wheels rotatably mounted thereon and drivingly connected thereto by said one-way clutch means;

a frame extending from the rear axle to the underside of the platform under the seat and affixed to the rear axle and the seat;

an upper body affixed to the frame;

a spring affixed at one end to the upper body and at the other end to the upper side of the foot rest of the platform; and

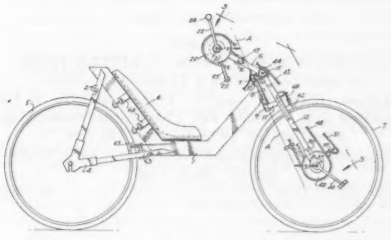
a pair of springs each affixed at one end to a corresponding side of the seat and at the other end to the upper body in a manner whereby when a child in the seat bounces up and down he propels the car by spring power.

3,910,599

HAND AND FOOT POWERED DRIVE SYSTEM FOR A VEHICLE

John C. Thomas, 2867 Harris St., Eugene, Oreg. 97405

Filed Nov. 15, 1974, Ser. No. 523,971
Int. Cl.[2] B62M *1/12*
U.S. Cl. 280—234 5 Claims



1. A drive system for a vehicle enabling use of an operator's arms and legs to provide a source of motive power jointly or separately to a powered vehicle wheel, said system comprising,

a live axle and sprocket combination adapted for rotation by the operator's legs,

a hub and wheel rotatably journalled on said axle,

a jackshaft assembly including a jackshaft with mutliple sprockets thereon,

a hand crankshaft and sprocket combination adapted for rotation by the operator's arms,

unidirectional clutch means associated with at least some of said sprockets and having clutch components engageable during rotation in one direction and operable to impart powered rotation to said jackshaft and to at least one of said jackshaft sprockets while permitting overrunning of clutch components in an opposite direction of rotation, and

power transmission means interconnecting said one of said jackshaft sprockets and said axle journalled hub and wheel to impart rotation to same.

3,910,600

BICYCLE FORK CROWN

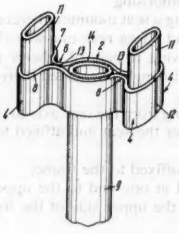
Julius Sprick, Auf der Benkert, Germany, assignor to Firma Julius Sprick KG, Germany

Filed Apr. 29, 1974, Ser. No. 464,925

Claims priority, application Germany, May 24, 1973, 2326504

Int. Cl.² B62K *19/20, 21/04*

U.S. Cl. 280—280 **6 Claims**



1. A fork crown for bicycle forks including a head tube and a pair of fork blades, said crown comprising a waved metal band having a front half and a rear half which halves are bulged so as to form mirror images of each other and which halves together completely surround a central receiving opening for said head tube each of said halves extending from said central receiving opening outwardly diametrically to form loops providing lateral receiving openings for said fork blades, said halves being formed of separate, shaped strip iron parts, said parts being connected together and to the fork blades by weld seams at the lateral ends of said parts, and said parts being connected together by weld seams between said central receiving opening and said lateral openings.

3,910,601

EXTENSION MODULE FOR A VEHICLE TO BE INCORPORATED IN A TRAILER SYSTEM

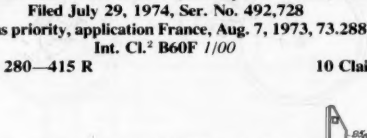
Jean-Jacques Michaud, Auxerre, France, assignor to Establissement Jean Nicolas et Fils, Champs-sur-Yonne, France

Filed July 29, 1974, Ser. No. 492,728

Claims priority, application France, Aug. 7, 1973, 73.28878

Int. Cl.² B60F *1/00*

U.S. Cl. 280—415 R **10 Claims**



1. In a trailer system including a heavy duty vehicle provided with several rows of *n* axles, *n* being an integer at least equal to 1, an extension module for said vehicle having a chassis supported by a row of *n* axles through a suspension of low stiffness as compared to the suspension of said vehicle, and pivot means for coupling the module and the vehicle for pivotal movement of the module about a vertical axis located in the longitudinal midplane of the vehicle at the rear thereof and against pivotal movement about a horizontal axis.

3,910,602

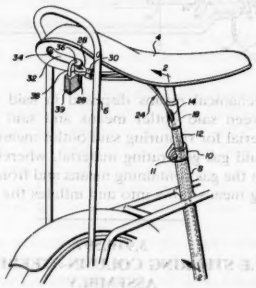
MEANS FOR STORING BICYCLE SECURITY CABLE

Henry Lindner, 262 Welter Dr., Wood Dale, Ill. 60191

Filed Apr. 12, 1974, Ser. No. 460,304

Int. Cl.² B62J *39/00;* **B62H** *5/00*

U.S. Cl. 280—289 **6 Claims**



1. In a bicycle seat assembly having a tubular bicycle frame part, a tubular post mounted in said frame part, and a seat member mounted on said tubular post, the inprovement comprising a port in said tubular post, an enlarged tubular portion around said post, a port in said tubular portion in registry with said tubular port, a flexible elongated member having a fold, said fold extending through said port into the passageway of said tubular post and means for holding the opposite ends of said flexible member in releasable locking engagement on the underside of said seat member.

2. In a bicycle seat assembly as claimed in claim **1**, the improvement further comprising a stop pin in the passageway of said frame part, said stop pin being positioned below and proximate to the tubular port, and said stop pin having opposite ends fixedly supported by opposite tubular wall portions of said frame part, said fold extending around said pin whereby said fold of said flexible member is intercepted by the pin when said member secures the bicycle to an anchoring structure.

3,910,603

BICYCLE SIDE STAND

David E. Shipman, 621½ Avenida Hermosa, West Palm Beach, Fla. 33406

Filed Mar. 18, 1974, Ser. No. 451,847

Int. Cl.² B62H *3/00*

U.S. Cl. 280—293 **9 Claims**

1. A bicycle side stand comprising:

a bracket adapted to be attached to the frame of a bicycle, said bracket having an aperture,

a rod having a cross sectional size smaller than the size of said aperture, said rod being adapted to be removably and loosely inserted in said aperture;

means responsive to the weight of said bicycle for engaging said rod and said bracket to prevent movement of said rod relative to said aperture,

said engaging means comprising a notch in said rod, said notch being adapted to coact with said bracket adjacent said aperture.

said engaging means further comprising
a depending projection, said projection being spaced from said aperture; and

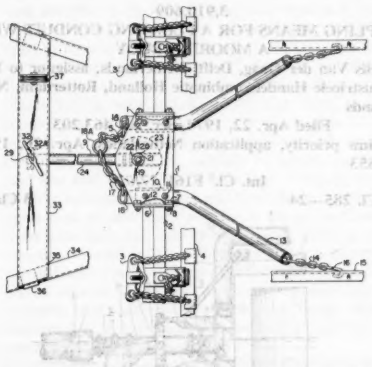
a second notch formed in said rod and spaced from said first mentioned notch, said second notch being adapted to receive said projection.

3,910,604

WEIGHT EQUALIZING DEVICE FOR AUTOMOBILE BUMPER HITCHES

John C. Abromavage, Tempe, and James W. Ryden, Phoenix, both of Ariz., assignors to Amerco, Inc., Phoenix, Ariz.

Filed Sept. 11, 1974, Ser. No. 504,935
Int. Cl.² B60D *1/16*
U.S. Cl. 280—406 A **13 Claims**



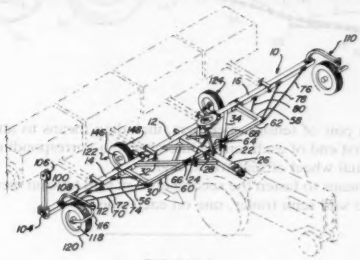
1. A weight equalizing device for hitches attached to vehicles, said hitches including a rigid mounting structure including a coupling for attachment to a mating coupling on the tongue of the trailer to be towed, said device comprising:
A. a bracket means rigidly attached to said rigid mounting structure and further comprising a platform bracket, and;
B. at least one spring bar, said bar having a proximate end which includes means mounted and horizontally pivotable upon said platform bracket, said bar having a distal end which includes first means for adjustably tensioning said spring bar relative to said trailer tongue, and;
C. a reaction arm assembly including at least one reaction arm, said arm having a proximate end mounted upon said platform bracket, and a distal end which includes a second tensioning means comprising a flexible connector removably connectable to the frame of said vehicle and operable to place said reaction arm assembly in tension relative to said vehicle frame.

3,910,605

GANG HITCHING APPARATUS

Jack DeWayne Danford, Denver, Colo., assignor to Jack DeWayne Danford and H. H. Champlin, both of Denver, Colo., part interest to each

Filed July 29, 1974, Ser. No. 492,538
Int. Cl.² B60D *1/16*; B60F *5/00*; B62D *53/00*
U.S. Cl. 280—415 R **4 Claims**



1. A gang hitching apparatus for pulling a plurality of farm implement units, said apparatus comprising:
a longitudinally extending hitch bar;
a plurality of hitching eyes spaced along said hitch bar extending from one side thereof for attachment to a plurality of farm implement units to be pulled by said hitch bar;
a centrally located main draft bar pivotally connected to a second side of said hitch bar opposite said first side thereof for movement between an operative position extending forwardly of said second side for connection to a pulling vehicle and an inoperative position extending upwardly from said hitch bar;
an auxiliary draft bar connected to one end of said hitch bar for movement between an operative position for moving said apparatus in a direction corresponding to the longitudinal axis of said hitch bar and an inoperative position so that it does not extend longitudinally beyond said one end of said hitch bar;
a plurality of wheels pivotally attached to opposite sides of said hitch bar about vertical axes and spaced so as not to interfere with farm implements connected to said hitching eyes, the axle of each of said wheels being rotatable about its respective vertical axis at least 90° so that said hitch bar is selectively movable in either direction perpendicular to its longitudinal axis by a vehicle connected to said main draft bar or in a direction corresponding to its longitudinal axis by a vehicle connected to said auxiliary draft bar; and
a fifth wheel assembly having:
a supporting arm pivoted at one end about a horizontal pivot to said apparatus independently of the pivotal movement of said main draft bar from an operative horizontal position to an inoperative raised position;
a fifth wheel mounted on the other end of said supporting arm for engagement with the ground forwardly of said main draft bar when both said main draft bar and said supporting arm are in horizontal position; and
means for holding said supporting arm in either said horizontal position or said raised position.

3,910,606

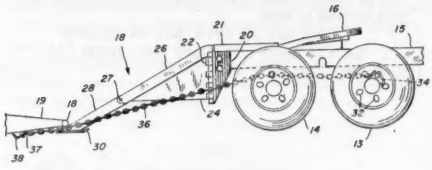
WRENCHLESS TRAILER TO CAB CONNECTOR

Finis Lavell Chisum, P.O. Box 1145, Claremore, Okla. 74107

Filed Nov. 15, 1974, Ser. No. 524,087
Int. Cl.² B62D *53/06*
U.S. Cl. 280—425 A **14 Claims**

1. Apparatus for mounting the front end of a semi-trailer to a tractor truck having dual rear wheels, comprising:

a. a pair of skids attached at their first ends to the rear of the truck frame, one on each side of the frame, their second ends resting on the ground;



b. a pair of tension members, including means to attach a first end of each tension member to a corresponding rear dual wheel of said truck; and

c. means to fasten the second ends of said tension members to said semi-trailer, one on each side.

3,910,607

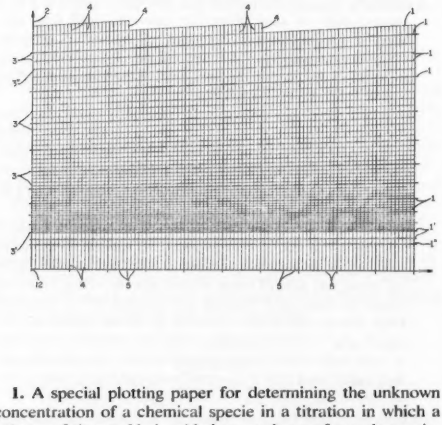
APPARATUS FOR DETERMINING THE CONCENTRATION OF SPECIES

John H. Riseman, Cambridge, Mass., assignor to Orion Research Incorporated, Cambridge, Mass.

Filed Feb. 7, 1972, Ser. No. 224,145

Int. Cl.² B41L *1/00*

U.S. Cl. 283—1 A **4 Claims**



1. A special plotting paper for determining the unknown concentration of a chemical specie in a titration in which a volume of titrant, V_t, is added to a volume of sample specie, V_s, which titration employs a Nernstian-responsive chemical sensing electrode responsive, with a slope N, to a chemical specie involved in said titration, said paper comprising:

a. means for defining a plane surface;

b. a line on said surface and defining an abscissa;

c. a line on said surface defining an ordinate intersecting said abscissa at an origin;

d. a plurality, P, of vertical lines on said surface spaced equally apart and intersecting said abscissa at a set of points to form a scale of P divisions on said abscissa; and

e. a plurality of lines distributed on said surface transversely to said vertical lines and spaced antilogarithmically apart with the distance between adjacent transverse lines increasing exponentially from said abscissa, said plurality of transverse lines intersecting the ordinate at a set of points which form an anti-logarithmic scale, each transverse line having a slope equal to the distance between its ordinate intercept and the origin, divided by the distance of P divisions times V_s/V_t.

3,910,608

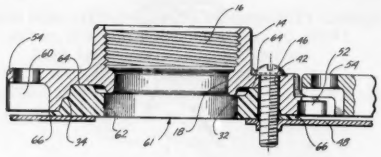
FITTING FOR CONNECTING ELECTRICAL CONDUIT TO A JUNCTION BOX

Lawrence Phillips, Jr., South Laguna, Calif., assignor to Unicorn Industries, Anaheim, Calif.

Filed Oct. 7, 1974, Ser. No. 512,239

Int. Cl.² F16L *41/00*

U.S. Cl. 285—3 **6 Claims**



1. A water-tight fitting for connecting an electrical conduit or other wire enclosing means to a junction box or the like, comprising:

a housing having a top wall and sidewalls integral with and extending around the periphery of the top wall, the sidewalls terminating in a common plane, an annular inner wall projecting from the top wall and terminating in said common plane, a collar integrally joined to the top wall within the perimeter of the inner wall, the collar forming a central passage extending through the top wall, the top wall forming a surface on the inside of the housing between the inner wall and the collar, the top wall having a plurality of mounting openings in each of the corners between the sidewalls and the inner wall, the top wall having at least two knockout areas within the inner wall for forming additional mounting holes.

3,910,609

COUPLING MEANS FOR A FLOATING CONDUIT WITH A MOORING-BUOY

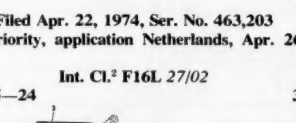
Cornelis Van der Gaag, Delft, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Filed Apr. 22, 1974, Ser. No. 463,203

Claims priority, application Netherlands, Apr. 26, 1973, 7305853

Int. Cl.² F16L *27/02*

U.S. Cl. 285—24 **3 Claims**



1. Coupling for a floating conduit with a mooring-buoy, said mooring-buoy comprising a pipe end with a clamp coupling for receiving and holding the mouth of the floating conduit, characterized in, that in the proximity of the clamp coupling a cardan joint has been secured to the pipe end fastened to the mooring-buoy, the cardan ring of said joint being rotatably connected with said pipe end via hinges with vertical shafts, a crosshead coupled to said ring about horizontal shafts and having means to provide floating capacity and being rotatable about said horizontal shafts, said crosshead being provided with a remote-control clamping mechanism, said clamping mechanism being capable of grasping the floating conduit and

releasing the same respectively, and means for swinging the crosshead downwards.

3,910,610

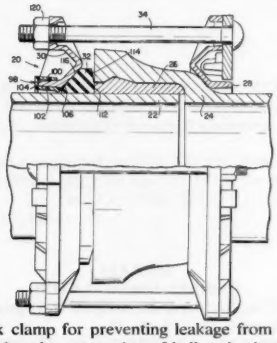
LEAK CLAMP FOR BELL AND SPIGOT PIPE JOINT

Frank E. Turner, San Mateo, and David Andries, Pacific, both of Calif., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 26, 1973, Ser. No. 326,879

Int. Cl.[2] F16L *21/06*

U.S. Cl. 285—337 **5 Claims**



1. A leak clamp for preventing leakage from the annular joint formed at the connection of bell and spigot pipes, said clamp comprising,

a plurality of identical arcuate segments, each having male and female coupler means at opposite ends for connecting said segments together in a first series to form a bell ring adapted to fit around and bear against a shoulder portion of said bell pipe and in a second series to form a spigot ring adapted to fit around said spigot pipe forming said joint with said bell pipe, all of said segments in said first and second series being identical, said arcuate segments having substantially cylindrical inner and outer flange portions which terminate at one end in ear members and at the other end in transverse walls, and male couplers extending from said ear members spaced from said one end of said flange portions, bridging walls extending between said inner and outer flange portions, the other end of said inner and outer flange portions, said transverse walls and said bridging walls forming pockets opening toward male couplers on other segments into which pockets said male couplers are received, said transverse walls being snugly received between said male couplers and said one end of said flange portions, whereby said pockets and male couplers coact to couple said segments together;

a circular gasket retained by said second series of arcuate segments against the end of said bell pipe;

and bolt means extending through said bell and spigot rings for drawing them together and forcing said gasket into sealing position against said annular joint.

3,910,611

MULTIPLE LATCH LOCK ASSEMBLY AND METHOD

Mike J. Slovensky, Jr., Twinsburg, Ohio, assignor to Cleveland Hardware & Forging Co., Cleveland, Ohio

Continuation of Ser. No. 237,715, March 24, 1972, Pat. No. 3,834,747. This application June 26, 1974, Ser. No. 483,110

Int. Cl.[2] E05C *1/12, 9/10*

U.S. Cl. 292—38 **6 Claims**

1. A door latch assembly comprising:

a plurality of latch units each having a reciprocating latch pin, pin guide means including a latch unit base partially enclosing said latch pin, and means for biasing said pins outwardly, operating means for substantially simultaneously withdrawing all of said latch pins inwardly including:

lengths of flexible cable each connected to at least one of said latch pins,

a housing defining a cavity and a pivotally mounted substantially flush handle substantially within said cavity,

a movable member connected to said handle,

the ends of said lengths of flexible cable remote from said latch pins being connected to said movable member,

said cable lengths being substantially in tension at all times, cable guide means directing movement of a portion of at least one of said lengths of flexible cable at an angle to the angle at which said length is connected to said movable member,

whereby pivoting of said handle in one direction reciprocates each of said latch pins against said biasing means to unlatch said door and pivoting of said handle in the opposite direction permits said biasing means to move said pins outwardly to latch said door.

3,910,612

MULTIPLE BOLT AND KEEPER LOCK

Francois Guiraud, Chambourcy, France, assignor to Fichet-Bauche, Velizy, France

Filed Feb. 1, 1974, Ser. No. 438,752

Claims priority, application France, Feb. 5, 1973, 73.3984; Nov. 13, 1973, 73.40327

Int. Cl.[2] E05C *9/04*

U.S. Cl. 292—33 **10 Claims**

1. A door locking device comprising:

an operating mechanism adapted to be actuated by a key;

a plurality of bolts vertically spaced over a distance substantially equal to the height of the door and being laterally movable between an unlocked position and a locked position wherein said bolts extend beyond the inner edge of the door;

transmission means connected between said operating mechanism and said bolts to move said bolts substantially simultaneously between said unlocked position and said locked position in response to manipulation of the key;

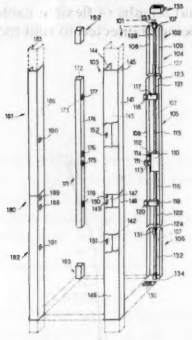
a first elongated case having a length substantially the same as the height of the door and housing said operating mechanism, said bolts and said transmission means;

said first case comprising openings for the passage of said bolts to said locked position;

means for securing said first case on the inner face of the door adjacent the inner edge thereof;

a second elongated case having a length substantially the same as the height of the door; and

means for securing said second case on the door frame adjacent the inner edge of the door;



said second case comprising keepers which, when said door is closed, are adapted to receive said bolts when they are moved to said locked position.

3,910,613

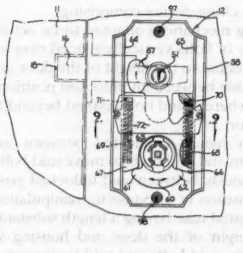
PANIC PROOF LOCK SET

Roger J. Nolin, Monterey Park, Calif., assignor to Tool Research & Engineering Corporation, Beverly Hills, Calif.

Filed Dec. 18, 1973, Ser. No. 425,736

Int. Cl.[2] E05B *63/14*

U.S. Cl. 292—34 **5 Claims**



1. A panic proof lock including a spring latch and a dead bolt which comprises:

a. an interior escutcheon;

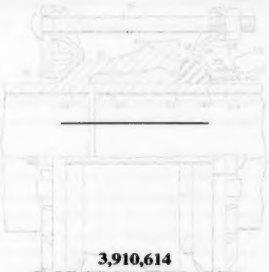
b. a knob coupled to said spring latch carried by said escutcheon;

c. means for operating said dead bolt carried by said escutcheon;

d. a crank coupled to said dead bolt operating means;

e. a push rod, said push rod being adapted to turn said crank either selectively clockwise or counterclockwise to a position generally corresponding to the open position of said dead bolt; and

f. means for moving said push rod in response to rotary motion of said knob whereby said dead bolt and said spring latch can be simultaneously retracted by turning said knob.



3,910,614

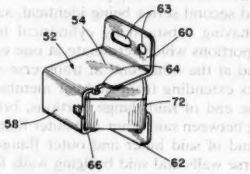
CABINET SPRING LATCH

William H. Coe, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Mar. 27, 1974, Ser. No. 455,299

Int. Cl.[2] E05C *3/12*

U.S. Cl. 292—219 **4 Claims**



1. An improved spring latch comprising, in combination:

a housing with parallel opposed spaced side walls and an intermediate connecting wall joining said side walls to form a partial enclosure, said side walls including opposed inwardly projecting tabs at one edge defining a rotational axis, said intermediate wall including a projection into said partial enclosure;

a pawl forming a latch, said pawl including parallel opposed spaced side walls with an interconnecting wall, said pawl side walls including opposed openings to receive said opposed housing tabs and retain said pawl in pivotal nesting relationship between said housing side walls for rotation about the rotational axis, said pawl side walls and interconnecting wall forming a pocket;

a spring engaging said housing projection at one end and said pocket at its opposite end, said spring operative to bias said pawl about the axis defined by the tabs and project said pawl from said housing to a position for engagement with a strike or the like.

3,910,615

Patent Not Issued For This Number

3,910,616

Patent Not Issued For This Number

3,910,617

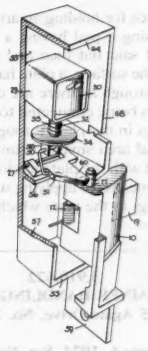
SOLENOID OPERATED ELECTRIC STRIKE

Anthony J. Scalza, Bronx, and William G. Brown, New York, both of N.Y., assignors to Square D Company, Park Ridge, Ill.

Continuation-in-part of Ser. No. 227,895, Feb. 20, 1972, abandoned. This application June 20, 1973, Ser. No. 371,576

Int. Cl.[2] E05C *19/16*

U.S. Cl. 292—341.16 **16 Claims**



1. An electric strike comprising a pivotally mounted catch, a detent pivotally mounted for movement of a portion thereof from a first position near said catch to a second position farther from said catch, means controlled by said catch and engageable with said portion of said detent in one of said positions for preventing rotation of said catch and movable with respect to said portion of said detent in the other position thereof to permit rotation of said catch, and electrically energizable solenoid with a movable core therein with a portion thereof extending from said solenoid, said solenoid, when energized, causing said portion of the core to move in a direction toward the interior of said solenoid and an interconnecting member extending from said core to said detent and pivotally connected at one end thereof to said core and pivotally connected at the other end thereof to said detent for moving said detent from said second position to said first position upon movement of said core in said direction.

3,910,618

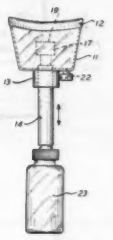
CONTACT LENS APPLICATOR

Enrico Massenz, 8807 First Ave., North Bergen, N.J. 07047

Filed Dec. 12, 1974, Ser. No. 532,173

Int. Cl.[2] A61F *9/00*

U.S. Cl. 294—1 CA **7 Claims**



1. A contact lens applicator:

a. a resilient, transparent, compressible cup with a normally oval opening having a general dimension larger than a widely open eye,

b. a generally central tubular enlargement in the bottom of the cup,

c. a tube frictionally seated in the tubular enlargement and extending at one end into the cup, and at the other end outside the cup,

d. a tubular conduit in the tube,

e. a seat for a contact lens in the cup and attached to the top of the conduit,

f. an annular seat in the tube,

g. a light spring in the tube engaged with the seat for the contact lens and with the annular seat, whereby the contact lens seat is yieldable to light contact with the eyeball.

3,910,619

SANITARY SCAVENGING IMPLEMENT

William L. Schmieler, 19609 Winslow Road, Shaker Heights, Ohio 44120

Division of Ser. No. 248,634, April 28, 1972, Pat. No. 3,804,448. This application Feb. 11, 1974, Ser. No. 440,958

Int. Cl.[2] A47L *13/52*

U.S. Cl. 294—19 R **4 Claims**

1. A scavenging implement comprising a rigid receptacle member having an inlet opening at one end;

a lid member for the receptacle member;

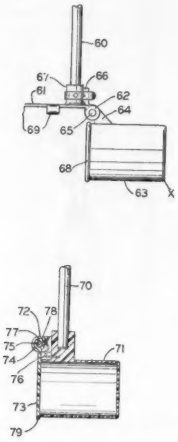
an elongated shaft having near one end a hand grip portion adapted to be gripped in the hand of an operator for manipulating the shaft, and connected at its other end to one of said members in fixed position relative thereto;

a hinge connecting said members together for swinging of the lid member to open and closed positions, respectively, relative to the receptacle member and having its axis

disposed in a plane generally normal to the axis of the shaft;

holding means located in its entirety adjacent said other end of the shaft and operative to hold the members yieldably in one of said positions when the members are moved into said one of said positions; and

said holding means including an element on, and in fixed position relative to, one of the members, and cooperative resilient means on, and in fixed position relative to, the other of said members.



3,910,620

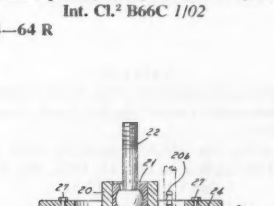
HIGH TEMPERATURE VACUUM PAD LIFT

Gene Sperry, Salem, Ill., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Apr. 15, 1974, Ser. No. 460,881

Int. Cl.² B66C *1/02*

U.S. Cl. 294—64 R **6 Claims**



1. A high temperature lifting pad comprising a body,

a ring on said body,

said ring being made of elastomeric material,

said ring having an exposed surface for contacting an article to be lifted,

a layer of quartz cloth bonded to said exposed surface.

3,910,621

SUCTION DEVICES

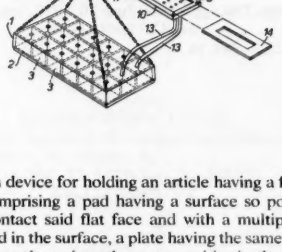
Geoffrey Philip Hillier, Borehamwood, England, assignor to Go-Con Concrete Limited, London, England

Filed Jan. 23, 1974, Ser. No. 435,867

Claims priority, application United Kingdom, Jan. 23, 1973, 3326/73

Int. Cl.² B66C *1/02*

U.S. Cl. 294—64 R **8 Claims**



1. A suction device for holding an article having a flat face, the device comprising a pad having a surface so positioned that it can contact said flat face and with a multiplicity of cavities formed in the surface, a plate having the same number of openings therethrough as there are cavities in the surface, each of said cavities being connected to one end of a separate one of said openings in the plate through passage means having a cross-sectional area smaller than that of said cavity, a template associated with the plate to close off selected ones of said openings, and means for applying suction to the other end of all of the openings in the plate which are not closed off by the template.

3,910,622

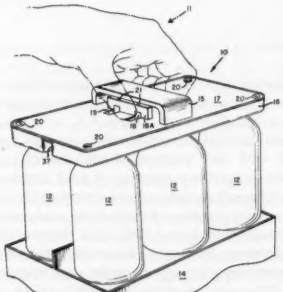
CONTAINER HANDLING DEVICE

Lynn E. Nies, 3465 Agate Drive, No. 2, Santa Clara, Calif. 95051

Filed June 6, 1974, Ser. No. 477,038

Int. Cl.² B65D *71/00*

U.S. Cl. 294—87.2 **1 Claim**



1. A container handling device comprising:

a housing;

gripping means on the housing bottom adapted to receive and operable to grip a plurality of container tops positioned in side-by-side order, said gripping means including a plurality of openings in the housing bottom adapted to receive the container tops;

a handle fixed to the housing and adapted to be grasped by a hand;

lever means positioned immediateley adjacent to the handle and operable by the fingers of the hand grasping the handle for operating the gripping means;

said gripping means comprising a plurality of openings in the housing bottom adapted to receive the container tops with means for gripping the container tops positioned within the housing comprising a cable supported adjacent the container tops and threaded within said housing so as to extend down two sides of each opening with the cable being spring biased away from the opening and adapted to be pulled tight and pressed towards the opening from each side and thereby tightened around to grasp the container tops therein when the lever means is operated; and

means for spring loading the cable and lever to a non-gripping position, whereby said device can be placed over a plurality of containers and operated by hand to lift a plurality of containers in unison.

3,910,623

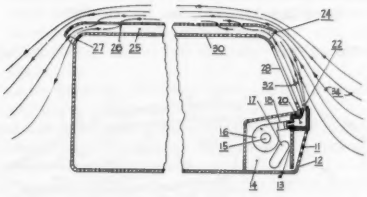
MEANS AND METHODS FOR REDUCING ONCOMING AIR RESISTANCE AND ANGLE WIND EFFECTS TO A MOVING VEHICLE

Joseph E. McKeen, 10861 Elm Ave., Lynwood, Calif. 90262

Filed Jan. 3, 1972, Ser. No. 214,689

Int. Cl.[2] B62D *35/00*

U.S. Cl. 296—1 S **4 Claims**



3. A vehicle having means for lowering the resistance of oncoming air to its front end as the vehicle moves forward and for reducing the effects of angle winds and wind currents induced by said vehicle as it moves, comprising:

a transverse opening in said front end, said opening having means for directing an air stream up the front end and along the top of said vehicle,

means for producing a flow of air in an air stream out of said transverse opening, and

duct means associated with the top of said vehicle and having an inlet and an outlet and vents along its length, whereby the oncoming air in front of said vehicle joins and follows the path of said air stream, thereby decreasing the air resistance to the front end of said vehicle, and protecting said front end from particles carried by said oncoming air, and whereby a portion of said air stream may enter said duct through said vents when the air pressure outside said duct is greater than the air pressure inside said duct and whereby air may go through and out said duct through said vents when the air pressure around said duct is lower than the air pressure inside said duct, thereby reducing the effects of angle winds and wind currents induced by said vehicle as it moves.

3,910,624

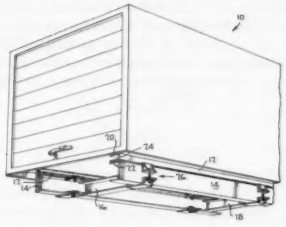
TRUCK BODY MOUNTING CLIP

Robert L. Becker, Louisville, Ky., assignor to Dealers Truck Equipment Inc., Louisville, Ky.

Filed Apr. 2, 1974, Ser. No. 457,211

Int. Cl. B62d *23/00*

U.S. Cl. 296—35 R **9 Claims**



1. An apparatus for securing a mountable highway body on a vehicle comprising:

chassis rails forming a part of the vehicle;

said rails having a C-shaped cross-section including top and bottom horizontal legs;

a clamp assembly for each of said rails;

each assembly including a first clamp member having a first clamp leg positioned between one of said rails and said equipment, said first clamp leg thereby serving to space said rail from said highway body, means for securing said first clamp leg to said highway body, said first clamp member further having a second clamp leg extending laterally from the side of said one rail, bearing means between said first and second clamp legs, said bearing means positioned along the side of said C-shaped rail to prevent lateral shifting, retainer means attached to the first clamp leg and bearing on the edge of the horizontal leg of said rail to further prevent lateral shifting, means for tightening said retainer means thereby further securing said clamp members to said horizontal leg, fastener means on said second clamp leg; and

clamp means bearing against the underside of said rail for attachment to said fastener means, said clamp means including a second clamp member and retainer means substantially identical to and positioned vertically from so as to be complementary to the first mentioned clamp member for balanced clamping, whereby combined functions of securing and spacing of said highway body with respect to said rails may be effected.

3,910,625

APPARATUS FOR RAISING A MOVABLE COVER OF AN AUTOMOBILE TRUNK

Michel Menard, Chaville, France, assignor to Regie Nationale des Usines Renault and Societe dite: Automobiles Peugeot, both of Paris, France

Filed Feb. 28, 1974, Ser. No. 446,741

Claims priority, application France, Mar. 20, 1973, 73.09957

Int. Cl.[2] B60R *5/00*

U.S. Cl. 296—37 R **6 Claims**

1. An apparatus for automatically lifting a movable cover of a trunk of an automotive vehicle comprising:

a trunk lid covering said trunk of said vehicle;

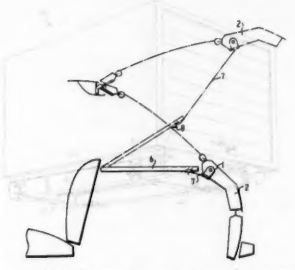
a movable cover disposed within said trunk of said vehicle;

roller means secured to the inside of said trunk lid of said vehicle for supporting a band of predetermined length being wound thereon;

means for securing a free end of said band wound upon said roller means to said movable cover of said trunk of said vehicle; and

means for tensioning said band so as to urge rewinding of said band on said roller means following unwinding thereof,

whereby upon raising said trunk lid of said vehicle and thereby moving said roller means away from said movable



cover, said band is caused to unwind from said roller means until payed out a predetermined length, whereupon said movable cover will be lifted by further raising said trunk lid, and upon lowering said trunk lid said band will automatically be rewound upon said roller means by said tensioning means.

3,910,626

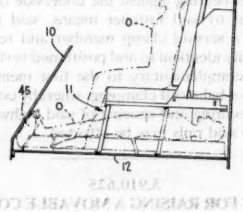
CONVERTIBLE SEAT FOR SLEEPER CAB

Dean Hobbensiefken, Lyons, Oreg., assignor to Ryder Truck Rental, Inc., Miami, Fla.

Filed Aug. 14, 1974, Ser. No. 497,395

Int. Cl.² B60N 1/10

U.S. Cl. 296—69 **9 Claims**



1. A convertible seat construction for a sleeper cab having a floor wall, comprising:

a seat bottom;

a seat back pivotally interconnected with said seat bottom;

leg members hingedly connected at one end thereof to said seat bottom and hingedly connected at the other end thereof to said floor wall for supporting said seat bottom;

vertical guide means for said seat back; and

roller means interconnecting said seat back with said guide means;

said seat back being thereby guided along said vertical guide means between an erect position and a lowered position lying against said floor wall, and said seat bottom being pivoted about said other ends of said leg members between an upward position spaced from said floor wall and a lowered position lying against said floor wall, whereby said seat back and said seat bottom together form both an upright seat as well as a collapsed horizontal sleeper.

3,910,627

SUN VISOR BLADE AND CLIP ASSEMBLY

Engelbert A. Meyer, Union Lake, Mich., assignor to USM Corporation, Boston, Mass.

Filed Mar. 18, 1974, Ser. No. 451,776

Int. Cl.² B60J 3/00

U.S. Cl. 296—97 H **7 Claims**

1. A visor assembly for mounting on a carrier rod, the assembly comprising a body having a circumferentially rigid hinge portion and a distortable visor planar portion integrally extending along one side thereof, an end of the hinge portion having an axial bore slightly larger in diameter than the diameter of the rod, and a clip nonrotatably mounted in the bore, said clip including two or more axially spaced non-circular bands each end of each band merging into and being integral with an opposite side of the clip, said bands formed to be distended in tension about the circumference of the rod and to frictionally engage and grip said rod.

3,910,628

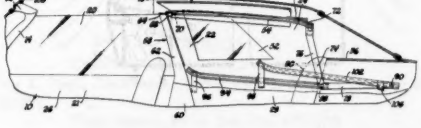
RETRACTABLE ROOF CLOSURE

Wayne E. Nantau, Fraser, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 23, 1974, Ser. No. 472,517

Int. Cl.² B60J 7/00

U.S. Cl. 296—137 F **3 Claims**



1. In a vehicle body having a passenger compartment, a fixed roof panel supported at its forward edge by roof pillars, and a windshield header spaced from the fixed roof panel to provide a roof opening, a retractable closure for selectively opening and closing the roof opening comprising: a closure panel fitting within the opening in closed position, first roller means mounted on the vehicle body rearwardly of the roof opening, first guide track means on the closure panel and extending rearwardly of the closure panel underneath the fixed roof panel into engagement with the first roller means, a pair of L-shaped control arms, each including a first leg attached to the closure panel adjacent each side thereof and depending vertically from the rearward end thereof in substantially parallel relationship with a respective roof pillar and a second leg extending rearwardly from the first leg, second and third roller means mounted in longitudinally spaced relation on the rearwardly extending second leg of each control arm, and second and third guide track means on each side of the vehicle body respectively receiving the second and third roller means, the inter-engagement of the respective roller means with the respective guide track means cooperating to support the closure panel and define the path of movement thereof between open and closed positions.

3,910,629

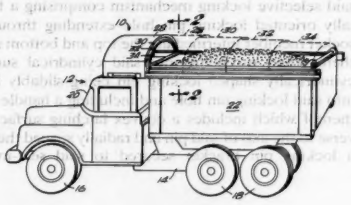
TELESCOPIC COVER FOR THE LOAD-CARRYING BODY OF A TRUCK

Boyd Woodard, 6995 NW. 32nd Ave., Miami, Fla. 33147

Filed Dec. 23, 1974, Ser. No. 535,272

Int. Cl.[2] B60J 7/00

U.S. Cl. 296—137 B 14 Claims



1. A telescopic cover for the load carrying body of an open top truck comprising;

A. a plurality of telescopic cover sections, adapted to be moved from a normally open, retracted disposition to an extended, closed disposition relative to the open top load-carrying body of the truck;

B. upper and lower track means fixed to and extending along the length of both sides of the load-carrying body;

C. roller means carried by opposed, generally downwardly-extending side skirt portions of each of said plurality of cover sections, engaged with said track means for rearward and forward movement therealong;

D. reversible motor drive means;

E. a first pulley means, drivingly connected to said motor drive means;

F. cable means, engaged with said first pulley means, connected to one of said cover sections in a manner whereby said telescopic cover sections may be selectively moved from said normally open, retracted disposition to said extended, closed disposition or from said extended, closed disposition to said normally open, retracted disposition; and

G. a second pulley means to direct said cable means to said one cover section,

and said roller means of a portion of said plurality of telescopic cover sections are engaged with each of said upper and lower parallel tracks.

3,910,630

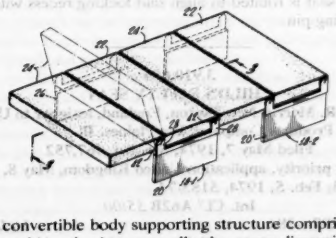
SEAT AND COUCH STRUCTURE

Wilbur D. Runyon, 2437 Cambridge, Fullerton, Calif. 92634, and Carl Dudugjian, 231 Buttonwood Drive, Brea, Calif. 92621

Filed Aug. 6, 1973, Ser. No. 385,822

Int. Cl.[2] A47C 1/026, 13/00

U.S. Cl. 297—63 5 Claims



1. A convertible body supporting structure comprising:

four cushions having generally the same dimensions and each having at least one pair of generally parallel edges;

means pivoting each cushion on one of four fixed parallel axes spaced from one another a distance substantially matching the distance between said pair of generally parallel edges;

means supporting said cushions and said pivoting means on said axes in an elevated relation to a horizontal reference;

means locking each of said pivotally supported cushions in either of two opposite horizontal positions and in other positions above and between the two opposite horizontal positions whereby positioning and locking of the cushions is available to provide a choice of:

1. two chair-like structures facing each other;
2. two chair-like structures back to back;
3. two chair-like structures facing in the same direction; and
4. a surface to support a recumbent body.

3,910,631

COLLAPSIBLE TABLE

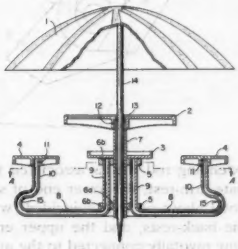
Yoshisada Inaba, Osaka, Japan, assignor to Kabushiki Kaisha Shinsei Kinzoku Seisakusho, Osaka, Japan

Filed Sept. 20, 1972, Ser. No. 290,755

Claims priority, application Japan, Dec. 11, 1971, 46-116844

Int. Cl.[2] A47B 3/00, 3/06, 37/04, 83/02

U.S. Cl. 297—159 8 Claims



1. A collapsible table which can be readily folded into a compact state comprising at least one support element having a central bore and a plurality of radially disposed bores, a main pipe disposed in the central bore, a table coaxially disposed around and fitted on the top end portion of the main pipe, a plurality of substantially U-shaped subordinate pipes, each having a base portion and a first and second free end portion and extending radially from the main pipe, the first of said free end portions being disposed in the radial bores, the second of said free end portions terminating in stools and each of said base portions being adapted to provide contact with the surface of the ground and providing support for both the table and the stools, the base portions of said subordinate pipes having a stabilizing portion which extends radially beyond the center of the respective stools and then returns on itself to a position for vertically supporting said stools, said extending portion increasing the stability of the table and stools, said first free end portions being rotatably disposed in said radial bores so that they can be radially positioned for maximum support or readily folded into a compact state.

3,910,632

MULTI-PLACE SEATS

Robert René Marechal, Paris, France, assignor to SICMA - Societe Industrielle et Commerciale de Material Aeronautique, Paris, France

Filed Feb. 15, 1974, Ser. No. 443,024

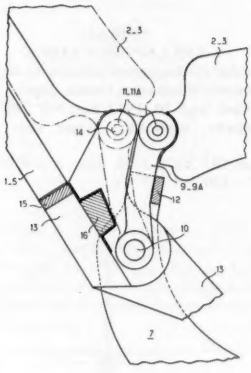
Claims priority, application France, Apr. 17, 1973, 73.14496

Int. Cl.[2] A47C 15/00; B64D 11/06

U.S. Cl. 297—232 7 Claims

1. In a multi-place seat,

fixed support means,
transverse shaft means carried by the support means said transverse shaft means having a pivotal axis,
a plurality of adjacent back-rests pivotal individually about said shaft means,
a plurality of arm-rests including at least one intermediate each adjacent pair of back-rests,
means mounting at least the intermediate arm-rests for pivotal movement, whereby said arm-rests can be raised, said mounting means comprising,



upwardly extending rod means associated with each said intermediate arm-rest, the lower end of said rod means being pivotal about an axis coincident with the pivotal axis of the back-rests, and the upper end of said rod means being pivotally connected to the arm-rest,
first abutment means rigid with the said fixed support means for limiting forward pivotal movement of the rod means, second abutment means rigid with the arm-rest and the rod means for limiting pivotal movement of the arm-rest relative to the rod means, and
third abutment means rigid with the back-rest for limiting rearward unitary movement of the rod means and the arm-rest when the arm-rest is in a raised position.

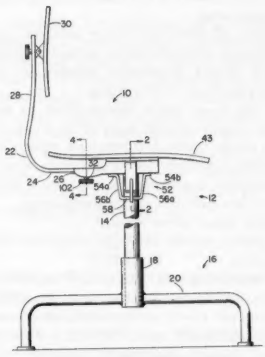
3,910,633
SWIVEL CHAIR WITH LOCKABLE SWIVELING MECHANISM

Douglas D. Marsh, Auburn, Ind., assignor to Garrett Tubular Products, Inc., Garrett, Ind.

Filed May 9, 1974, Ser. No. 468,393
Int. Cl.[2] A47C *3/00*
U.S. Cl. 297—349 **3 Claims**

1. A stool with a lockable swiveling mechanism, which comprises:

a. a lockable seat-swiveling and seat-mounting mechanism which includes a vertically disposed post member, a vertically disposed socket member swivelly mounted onto said post member, a seat-mounting bracket having a horizontal seat-mounting surface and attached to one of said members with said mounting surface proximal to the upper end thereof, means for preventing longitudinal movement of said socket member in relation to said post member, and means for selectively locking said mechanism against rotational movement of said socket member with respect to said post member;
b. a base and leg assembly connected to the other of said members, including a base and a plurality of legs connected thereto and extending both downwardly and outwardly from said other member, thereby providing a stable support against rotational movement of said other member relative a horizontal floor;
c. a seat being attached to said horizontal seat-mounting surface;
d. said one member comprises said socket member, and said socket member includes a vertically disposed cylindrical socket surface therein;
e. said other member comprises said post member;
f. said selective locking mechanism comprising a horizontally oriented locking pin hole extending through said socket member intermediate the top and bottom surfaces thereof and extending into said cylindrical surface, a cylindrically shaped locking pin being slidably inserted into said locking pin hole and including a handle portion thereof which includes a convex latching surface transverse to the axis of said pin and radially spaced therefrom, a locking pin bracket secured to said seat-mounting



bracket and being attached to said socket member in spaced relationship thereto and including both a second locking pin hole in alignment with first said locking pin hole and a notched latching flange with the notch thereof distal from said socket member and radially displaced from said locking pin holes, and a spring resiliently urging said locking pin toward said post member, and a locking recess in said post member being shaped and vertically positioned to accept said locking pin; and
g. said spring resiliently maintaining said convex latching surface in engagement with said notch when said convex latching surface is selectively placed therein to prevent engagement between said locking pin and said locking recess, and said spring resiliently urging said locking pin into said locking recess when said convex latching surface is selectively rotated to avoid contact with said notch and said seat is rotated to align said locking recess with said locking pin.

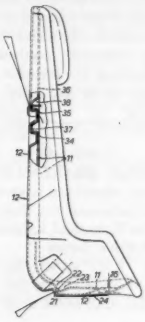
3,910,634
CHILD'S SAFETY SEAT

Anthony R. Morris, New Duston, England, assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 7, 1974, Ser. No. 467,752
Claims priority, application United Kingdom, May 8, 1973, 21816/73; Feb. 5, 1974, 5153/74
Int. Cl.[2] A62B *35/00*
U.S. Cl. 297—384 **16 Claims**

1. A child's seat for a vehicle, comprising a bucket-type seat shell molded in plastics material and having a forward wall and a rearward wall joined together to define a closed hollow-walled structure having back, bottom and side wall portions,

the walls also abutting together at selected positions, some abutting portions of the walls having slots therein forming



openings through the seat for the reception of straps of a body harness and for the reception of mounting straps.

3,910,635

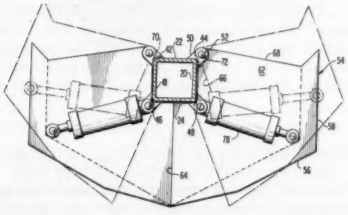
BOTTOM DUMP HAUL UNIT

Francis H. Holland, 32nd St. West & Hesper Rd., Billings, Mont. 59102

Filed June 27, 1974, Ser. No. 483,704

Int. Cl.[2] B60P *1/00*

U.S. Cl. 298—35 M **2 Claims**



2. A haul/dump unit comprising:

a prime mover having ground wheels and having a trailing end;

a trailer assembly connected to the trailing end of the prime mover;

the trailer comprising an elongated central beam having a horizontal main extent with forward and rear sections;

the main extent of the beam being substantially rectangular and having top and bottom edges;

pairs of pivot means extending from the main extent of the central beam in oppositely arranged pairs adjacent the forward and rear sections thereof;

bucket members, each including a bottom wall, an outer side wall, and front and rear end walls, the bucket members being generally coextensive in length with the main extent of the beam and being pivotally connected thereto; the end walls of the bucket members having means associated with the pairs of pivot means on the central beam whereby the bucket members are pivotally connected to the central beam on opposite sides thereof;

the bucket member front and rear walls being shaped to engage about the beam; and

extensible and retractable cylinders pivotally connected to the end walls of the bucket members and to the beam whereby extension of said cylinders pivots the bucket members to elevated, open positions, and retraction of the cylinders closes the bucket members.

3,910,636

PROCESS FOR IN-SITU MINING

Robert A. Hard, Lexington, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Filed Dec. 6, 1973, Ser. No. 422,232

Int. Cl.[2] E21C *41/08*

U.S. Cl. 299—5 **9 Claims**

1. A process for the recovery of metal values contained in a primary sulfide mineral containing deep lying underground formation and which comprises the steps of:

a. drilling at least one well into a primary sulfide mineral containing deep lying underground formation;

b. casing and sealing at least a portion of said well;

c. injecting an acidic leach solution containing nitrate ions into said formation through said well, the acidic leach solution having a pH value between about 0.5 and 1.5, containing from about 1 to about 10% by weight based on total weight of the acidic leach solution of a nitrate material selected from the group consisting of alkali metal nitrates, ammonium nitrates, ferric nitrate, nitric acid and mixtures thereof, and having a hydrogen ion to nitrate ion ratio of at least 4 whereby the acid in the acidic leach solution is not substantially consumer by host rock in the formation;

d. passing the acidic leach solution through said formation; and

e. recovering a pregnant leach solution containing the dissolved metal values from at least one well.

3,910,637

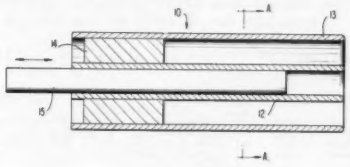
FILAMENT PICKING APPARATUS

John C. Lewis, Jr., Middlebury, Vt., assignor to Tucel Industries, Inc., Middlebury, Vt.

Continuation-in-part of Ser. Nos. 186,659, Oct. 5, 1971, Pat. No. 3,799,616, and Ser. No. 154,055, June 17, 1971, Pat. No. 3,798,699. This application Mar. 21, 1974, Ser. No. 453,315

Int. Cl.[2] A46D *1/08*

U.S. Cl. 300—2 **9 Claims**



1. In an apparatus for making tufted constructions including a stock box for supporting parallel cut-to-length synthetic fibers, means for picking a plurality of said fibers from said stock box to form a tuft thereof, means for heat-sealing and fusing the nonworking end of said tuft, and means for mounting the nonworking end on a support, the improvement comprising:

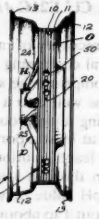
an elongated, hollow tuft picking element having a fiber-receiving opening therein and having a preselected cross-sectional configuration;

retaining means disposed within said element for compressing fibers entering the opening against the internal walls of said element to retain the tuft formed therein, said retaining means including at least one elongated, hollow inner picking element having a fiber-receiving opening therein; plunger means disposed within said inner picking element for selectively ejecting the tuft formed therein from said inner element.

3,910,638
WHEEL STRUCTURE

Delmer D. Scott, Encino, Calif., assignor to Western U.S. Industries, Fresno, Calif.

Filed May 9, 1974, Ser. No. 468,369
Int. Cl.[2] B60B 3/12
U.S. Cl. 301—63 R **10 Claims**

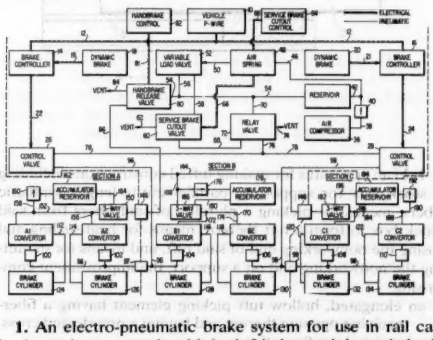


1. A wheel structure comprising an outer annular tire-engaging steel rim with an axially extending inner annular wall defining a radially inwardly disposed annular inner surface, a non-ferrous metal center more ductile than said rim arranged centrally within the rim and having a central hub portion, an outer ring portion and means between and joining the hub and ring portions, said ring portion having a straight axially extending radially outwardly disposed outer surface, opposing said inner surface, a plurality of axially spaced radially outwardly projecting ribs on said outer surface and in tight interfering engagement with the inner surface, a plurality of circumferentially spaced radially outwardly opening blind recesses in said ring portion between axially spaced ribs and opposing said wall and radially inwardly projecting dimples formed in said wall and extending into said recesses.

3,910,639
COMMUTER CAR BRAKE SYSTEMS

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 393,529, Aug. 31, 1973, and Ser. No. 480,441, June 17, 1974, Pat. No. 3,845,991. This application Nov. 1, 1974, Ser. No. 520,178
Int. Cl.[2] B60T 13/68
U.S. Cl. 303—3 **11 Claims**



1. An electro-pneumatic brake system for use in rail cars having at least one axle with both friction and dynamic braking means and at least one axle with only friction braking means, comprising:

means for producing a first fluid pressure signal proportional to the load carried by the rail car;

means for producing a first electrical signal proportional to any dynamic brake application force provided at said at least one axle with both friction and dynamic braking means;

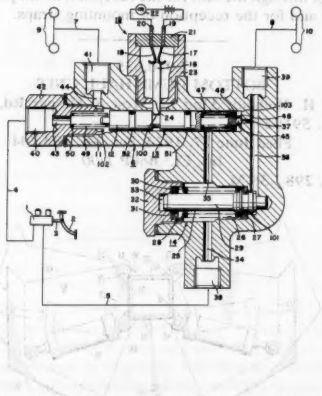
fluid pressure responsive means for simultaneously applying essentially equivalent friction braking pressure to the friction braking means at all axles; and

control valve means, responsive to said first fluid pressure signal, said first electrical signal and the pressure applied to said fluid-pressure-responsive means for simultaneously applying essentially equivalent friction braking pressure, for regulating the pressure applied to said friction braking means at all said axles.

3,910,640
HYDRAULIC BRAKING SYSTEM

Asao Kozakai, Okazaki; Masakazu Ishikawa, Toyota; Takaaki Ota, Okazaki, and Sadayoshi Ito, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jan. 17, 1974, Ser. No. 434,190
Claims priority, application Japan, Jan. 31, 1973, 48-12637
Int. Cl.[2] B60T 8/26
U.S. Cl. 303—6 C **5 Claims**



1. A hydraulic braking system for vehicles including means for generating hydraulic pressure, first and second wheel cylinders, first and second passages which connect said means for generating hydraulic pressure to said first and second wheel cylinders, the improvement comprising a hydraulic pressure loss warning device interposed between said first and second passages, said device comprising:

a first housing having a bore;

a piston adapted to be slidable within said bore which is fluidically connected to said first and second passages;

a rod made of insulation material one end of which is connected to said piston and which is pivoted in response to the movement of said piston;

automatically resettable switching means connected to the other end of said rod and which is in an open, non-warning position unde normal conditions, said switching means including two conductive springs having curled end portions which are biased apart and disconnected from each other by said rod under said normal conditions and which are permitted to be connected under pressure-loss conditions as a result of said pivotal movement of said rod;

means for warning of the braking hydraulic pressure loss which is interconnected to said switching means; and

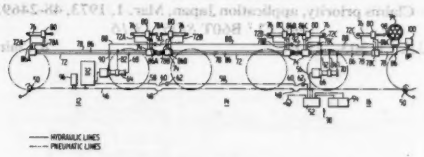
fulcrum means for retaining said rod and about which said rod is adapted to be shifted, wherein the length between said one end of said rod and said fulcrum is shorter than the length between said other end of said rod and said fulcrum.

3,910,641

BRAKE SYSTEM FOR AN ARTICULATED CARRIER

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed June 28, 1974, Ser. No. 484,187
Int. Cl.[2] B60T 13/26
U.S. Cl. 303—7 8 Claims



1. A brake system for a wheeled carrier having a plurality of separate sections flexibly joined into an articulated vehicle, each section including fluid pressure actuatable brake means, comprising:

a first fluid pressure conduit extending along each of said separate sections for conveying first fluid pressure changes along said carrier, said first conduit being separably joined between said sections;

means connected to said first conduit and located in at least one of said sections of said carrier for producing second fluid pressures in response to changes in said first fluid pressure;

a second fluid pressure conduit extending along each of said separate sections for conveying said second fluid pressures along said carrier, said second conduit being separably, resealably joined between said sections;

first and second means connected to said second conduit and located in separate ones of said sections for providing actuating pressure for said brake means in said carrier in response to said second fluid pressures; and

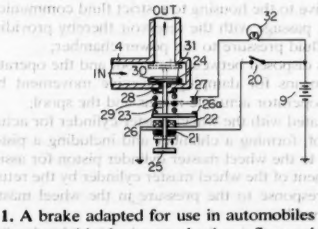
means located in at least one of said separate sections of said carrier for automatically actuating one of said means for providing actuating pressure for said brake means, in the event of a loss of pressure in said first conduit.

3,910,642

BRAKE FOR AUTOMOBILES PROVIDED WITH ELECTROMAGNETIC CUT-OFF VALVES

Osamu Kimata, Susono, and Hitoshi Furuya, Mishima, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed June 27, 1974, Ser. No. 483,524
Claims priority, application Japan, Sept. 28, 1973, 48-108554
Int. Cl.[2] B60T 17/18
U.S. Cl. 303—84 A 13 Claims



1. A brake adapted for use in automobiles in which a first and a second brake system having a first and a second wheel cylinder are provided by employing a tandem-type brake master cylinder having a first and a second cylinder, comprising:

a first hydraulic pressure detecting means mounted on the tandem master cylinder for detecting decrease in pressure in the first cylinder, from a predetermined value;

a second hydraulic pressure detecting means mounted on the tandem master cylinder for detecting decrease in pressure in the second cylinder, from a predetermined value;

a first means provided between the first cylinder and the first wheel cylinder for interrupting hydraulic connection therebetween and operated by said first hydraulic pressure detecting means in response to detection of the decrease in pressure in the first cylinder;

a second means provided between the second cylinder and the second wheel cylinder for interrupting hydraulic connection therebetween and operated by said second hydraulic pressure detecting means in response to detection of the decrease in pressure in the second cylinder;

a power source; and

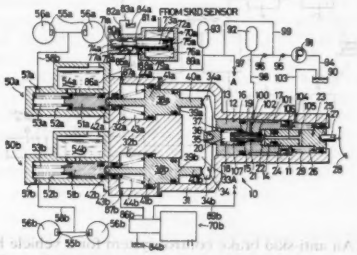
a switching means provided between the power source and said first and second means and responsive to said first and second pressure detecting means so that when said first hydraulic pressure detecting means detects a decrease in pressure in the first cylinder from a predetermined value, power is applied to said first means from the power source for operation thereof, while when said second hydraulic pressure detecting means detects a decrease in pressure in the second cylinder from a predetermined value, power is applied to said second means from the power source for operation thereof.

3,910,643

ANTI-SKID BRAKE CONTROL SYSTEM FOR A WHEELED VEHICLE

Uchiro Kobashi, Okazaki; Masami Inada, Toyoake, and Katsuki Takayama, Chiryu, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 21, 1973, Ser. No. 334,413
Claims priority, application Japan, Mar. 2, 1972, 47-22014; Mar. 2, 1972, 47-22015
Int. Cl. B60t 8/12
U.S. Cl. 303—21 F 2 Claims



1. An anti-skid brake control system for a wheeled vehicle having a manually operable brake pedal, a master cylinder and wheel brake cylinders hydraulically connected to said master cylinder, comprising;

a booster disposed between said brake pedal and said master cylinder,

a hydraulic pressure source supplying pressure to said booster for increasing the brake force applied to said master cylinder,

a reservoir hydraulically connected to said hydraulic pressure source,

means for generating a signal in response to a wheel locking condition, and

an electromagnetic valve means actuated by said signal for connecting said booster selectively with said reservoir and said hydraulic pressure source,

said booster including,

a valve means movable by said brake pedal and being connected selectively with said reservoir and said hydraulic pressure source,

a power piston means operably connected to said master cylinder and defining first and second chambers having different effective areas,

said first chamber communicating with said valve means, and said second chamber communicating with said electromagnetic valve means, said second chamber having a larger effective area than said first chamber, and

biasing means normally urging said power piston to the non-braking position,

whereby, in normal brake operation said first chamber is connected to said hydraulic pressure source and said second chamber is connected to said reservoir to actuate said power piston means, and in anti-skid brake operation, said second chamber is also connected to said hydraulic pressure source via said electromagnetic valve means whereby the higher pressure in said second chamber having the larger effective area and said biasing means actuates said power piston to decrease the brake force.

3,910,644
ANTI-SKID BRAKE CONTROL SYSTEMS

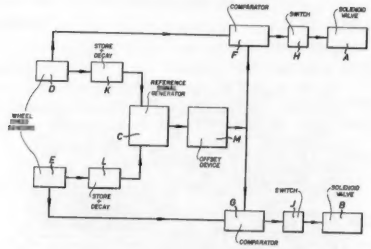
Mervyn Brian Packer, Leamington Spa, England, assignor to Automotive Products Co. Ltd., Leamington Spa, England

Filed Apr. 24, 1973, Ser. No. 353,960

Claims priority, application United Kingdom, Apr. 25, 1972, 19129/72

Int. Cl.[2] B60T *8/08*

U.S. Cl. 303—21 BE **15 Claims**



1. An anti-skid brake control system for a vehicle having a plurality of wheels having brakes associated therewith comprising: means for sensing the wheel speed of at least one of a plurality of vehicle wheels and generating wheel speed signals in response thereto, first means responsive to at least one of said wheel speed signals for releasing the brake pressure at the wheel associated with said wheel speed sensing means when wheel deceleration exceeds a predetermined amount, second means responsive to the wheel speed signal of said associated wheel for reapplying the brake pressure at said associated wheel when wheel speed approaches the speed it would have been doing had wheel slippage not occurred, third means responsive to at least one of said wheel speed signals for generating a vehicle speed related reference signal, and comparison means for comparing the wheel speed signal of said associated wheel and the vehicle speed related reference signal and inhibiting reapplication of brake pressure at the associated wheel via said second means when the vehicle speed signal exceeds the wheel speed signal of the associated wheel by a second predetermined amount for a predetermined time interval.

3,910,645
ANTI-LOCK BRAKE SYSTEM INCLUDING A CENTER BRAKE CONTROL BOOSTER DEVICE AND A WHEEL MASTER CYLINDER ASSEMBLY

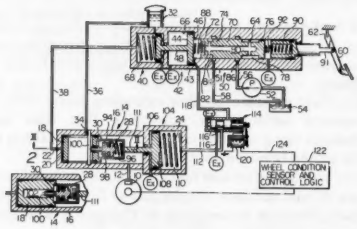
Yasuhisa Takeuchi, and Haruhiko Iizuka, both of Yokosuka, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 28, 1974, Ser. No. 446,829

Claims priority, application Japan, Mar. 1, 1973, 48-24693

Int. Cl.[2] B60T *8/06, 13/16*

U.S. Cl. 303—21 F **8 Claims**



1. In a motor vehicle having a fluid pressure operated wheel brake, a pump providing a source of fluid flow and pressure, a wheel master cylinder having a wheel master cylinder piston and a return spring, the wheel master cylinder being fluidly connected to the wheel brake, a center master cylinder fluidly connected to the wheel master cylinder, a fluid pressure operated booster associated with the center master cylinder for actuation thereof, the booster having a booster piston and a power chamber and a reservoir, the combination comprising: a housing forming the power chamber and having an inlet port communicating operating fluid from the pump and an outlet port in communication with the reservoir;

a spool having a passage therein communicating with the power chamber and having axially spaced lands slidingly engaging the housing, the lands and the ports being so constructed and arranged as to provide unrestricted communication between the passage and the outlet port when the spool is in its rest position, whereby the pressure in the power chamber is substantially zero;

means including the pressure of operating fluid in the power chamber and a biasing spring for biasing the spool to the rest position thereof;

operator actuable means adapted to progressively move the spool relative to the housing to restrict fluid communication of the passage with the reservoir thereby providing operating fluid pressure to the power chamber;

spring means disposed between the spool and the operator actuable means for damping excessive movement between the operator actuable means and the spool;

means associated with the wheel master cylinder for actuation thereof, forming a chamber and including a piston connected to the wheel master cylinder piston for assisting movement of the wheel master cylinder by the return spring in response to the pressure in the wheel master cylinder chamber;

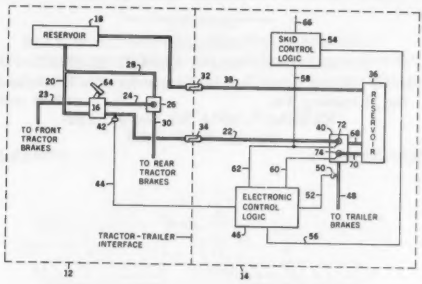
conduit means connecting the power chamber, the chamber and the reservoir; and

anti-lock valve means in the conduit means intermediate the power chamber and the wheel master cylinder chamber and said anti-lock valve means being adapted to selectively apply and release the operating fluid pressure to the chamber.

3,910,646
ELECTRO-PNEUMATIC AIR BRAKE VALVE AND SYSTEM COMPATIBLE WITH A SKID CONTROL SYSTEM

Arthur R. Grix, St. Louis, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Dec. 26, 1974, Ser. No. 536,596
Int. Cl.[2] B60T *8/04*
U.S. Cl. 303—21 A **10 Claims**



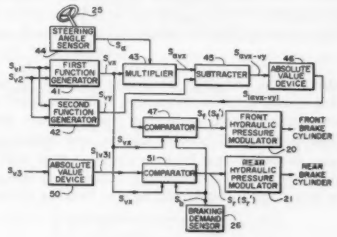
1. In a vehicle brake actuation system having contained fluid pressure and brake actuators operated by fluid pressure;
a first container of fluid pressure;
first valve means adjacent the first container connected for releasing a first impulse of fluid pressure from the first container;
a second container of fluid pressure;
second valve means adjacent the second container connected for receiving the first impulse, for receiving a second impulse from the second container and for releasing a third impulse of fluid pressure from the second container;
fluid conduit means interconnecting the first and second valve means;
fluid conduit means connected to the second valve means to communicate the third impulse to some of the brake actuators;
first sensor means connected for sensing fluid pressure between the first and second valve means and for producing a first signal proportional thereto;
second sensor means connected for sensing fluid pressure between the second valve means and some of the brake actuators and for producing a second signal proportional thereto;
first logic means connected for receiving and comparing the first and second signals for discriminately controlling communication of the first, second and third impulses with the second valve means; and
second logic means connected for discriminately interrupting communication of the first impulse with the second valve means.

3,910,647
SKID CONTROL SYSTEM

Yasuhisa Takeuchi, Yokosuka, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Dec. 6, 1973, Ser. No. 422,154
Claims priority, application Japan, Dec. 7, 1972, 47-121992
Int. Cl.[2] B60T *8/02*
U.S. Cl. 303—21 A **2 Claims**

1. A skid control system to modulate the pressure of fluid fed into front and rear hydraulic brake cylinders of a vehicle from a manually actuable hydraulic master cylinder; comprising:
a first doppler radar sensor which produces a first signal related to the relative velocity of the vehicle with respect to the road surface in a first angular direction relative to the longitudinal axis of the vehicle;
a second doppler radar sensor which produces a second signal related to the relative velocity of the vehicle with respect to the road surface in a second angular direction which is symmetrical with said first angular direction relative to the longitudinal axis of the vehicle;
a third doppler radar sensor which produces a third signal related to the lateral velocity of a rear portion of the vehicle;
a steering angle sensor to produce a steering angle signal related to the angular displacement of a manual vehicle steering control member from a central position;
a braking demand sensor to produce a braking signal when the master cylinder is manually actuated;
computing means to respectively produce forward and lateral signals related to the forward and lateral velocities



of the vehicle with respect to the road surface in response to said first and second signals;
a multiplier to produce a fourth signal related to the product of said forward signal and said steering angle signal;
a subtracter to produce a fifth signal related to the difference between said fourth signal and said lateral signal;
a first comparator to produce a sixth signal to produce the pressure of fluid in the front brake cylinder to prevent skidding of the vehicle if the magnitude of said fifth signal is greater than the magnitude of said forward signal and said braking signal is being generated by said braking demand sensor; and
a second comparator to produce a seventh signal to reduce the pressure of fluid in the rear brake cylinder to prevent skidding of the vehicle if the magnitude of said third signal is greater than the magnitude of said forward signal and said braking signal is being generated by said braking demend sensor.

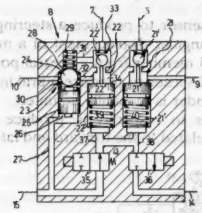
3,910,648
APPARATUS FOR THE PREVENTION OF WHEEL LOCKING IN MOTOR VEHICLES

Klaus-Otto Riesenberg, Ludwigsburg-Ossweil, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Apr. 30, 1974, Ser. No. 465,496
Int. Cl.[2] B60T *8/06, 13/16*
U.S. Cl. 303—21 F **5 Claims**

1. In a wheel lock prevention apparatus for motor vehicles having a first and second braking circuit forming part of a two circuit braking system, with a pressure transducer for each circuit and two groups of pressure receivers, the system further including a wheel lock prevention valve assembly connected to said circuits, vehicle wheel sensors connected to said valve assembly, and an electronic control device connected to said sensors and said valve assembly, said control device processes the signals sensed by the sensors and transmits them to the valve assembly, said valve assembly including therein at least one reduction valve having a control volume and an electromagnetic valve pair connectible with the control volume of the reduction valve and serving as an inlet and outlet valve for the control volume of the reduction valve, the

improvement comprising a switching valve connected to said second braking circuit and to a pressure medium within said first braking circuit and means connecting said electromagnetic valve pair to the pressure medium within said first braking circuit, wherein the electromagnetic valve pair controls the two braking circuits by controlling the pressure medium of the first braking circuit, which pressure medium actuates said



switching valve, wherein when the pressure in said second braking circuit is low with respect to the pressure in said first braking circuit, said switching valve closes the passage through said second braking circuit, and wherein when the pressure in said second braking circuit is high with respect to the pressure in said first braking circuit, said switching valve opens a passage through said second braking circuit.

3,910,649

HYDRAULIC DEVICE FOR STRETCHING THE TRACKS OF A TRACKED VEHICLE

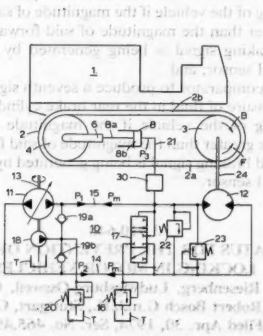
Björn Röskaft, Molde, Norway, assignor to Glamox A/S, Norway

Filed Apr. 25, 1974, Ser. No. 464,617

Claims priority, application Norway, Apr. 26, 1973, 1727/73

Int. Cl.² B62D *55/00*

U.S. Cl. 305—10 **18 Claims**



1. A hydraulic track stretching system for use in a tracked vehicle of the type including at least one track system comprising a track passing around a bull wheel and an idler, and a closed circuit hydrostatic power transmission system operatively coupled to said bull wheel for alternatively driving said bull wheel in a first direction moving the lower run of said track from said idler to said bull wheel, driving said bull wheel in a second direction moving said lower track run from said bull wheel to said idler, or placing said bull wheel in a neutral position; said closed circuit hydrostatic power transmission system having a portion maintained at a higher drive pressure when said bull wheel is driven in said second direction and maintained at a lower feed pressure when said bull wheel is driven in said first direction or placed in said neutral position; said track stretching system comprising:

a hydraulic stretching cylinder having a piston therein, said piston having a rod connected to said idler, said piston and rod being movable in response to fluid pressure in said cylinder toward said idler and thereby comprising means for moving said idler away from said bull wheel; and

means for hydraulically connecting said cylinder with said portion of said closed circuit hydrostatic power transmission system and for maintaining said cylinder pressure proportional to the pressure in said portion.

3,910,650

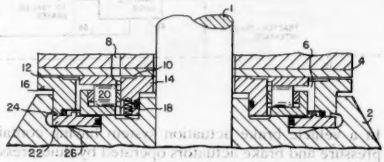
HYDROSTATIC AXIAL THRUST BEARING

Charles Edward Kraus, Austin, Tex., assignor to Excelermatic, Inc., Leesburg, Va.

Filed Oct. 7, 1974, Ser. No. 512,512

Int. Cl.² F16C *17/16*

U.S. Cl. 308—9 **9 Claims**



1. In a hydrostatic axial thrust bearing including: a support member; a rotatable load member disposed opposite said support member, said members having a cavity formed therebetween; means for admitting pressurized fluid to said cavity for supporting said load member on said support member; and an antifriction bearing supported in said cavity by one of said members for supporting the opposite member the improvement comprising: fluid pressure sensitive means associated with said bearing for spacing said opposite member and the antifriction bearing from each other when the fluid in the pressurized fluid admitting means is sufficiently pressurized to insure support of the load member by the support member.

3,910,651

SHAFT BEARING ASSEMBLIES

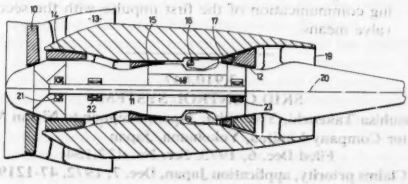
Bryan Robert Pearce, and Douglas William Daniels, both of Bristol, England, assignors to Rolls-Royce (1971) Limited, London, England

Filed Nov. 13, 1973, Ser. No. 415,343

Claims priority, application United Kingdom, Nov. 24, 1972, 54476/72

Int. Cl.² F16C *27/00*

U.S. Cl. 308—26 **11 Claims**



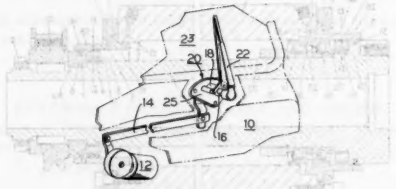
1. A shaft bearing assembly comprising a shaft member, a structural member and a bearing for supporting the shaft member for rotation relative to the structural member, the bearing having first and second races, means for mounting one each of the bearing races on the shaft member and the structural member respectively, said mounting means including means for allowing relative transverse movement between one

of the races and its respective member and means for resisting said movement, wherein there is provided a first seal having components connected for movemenet with each of the bearing races for form a seal across the bearing, and a second seal having components respectively connected to that bearing race and that member between which said relative movement takes place, said second seal including means whereby the transverse movement can be accommodated while maintaining the seal.

3,910,652
SELF-DIMENSIONING BEARING ASSEMBLY

William C. Riester, Williamsville, and Bronislaus S. Graczyk, Snyder, both of N.Y., assignors to Trico Products Corporation, Buffalo, N.Y.

Filed Mar. 29, 1974, Ser. No. 455,971
Int. Cl.² F16C *13/00*
U.S. Cl. 308—26 **6 Claims**

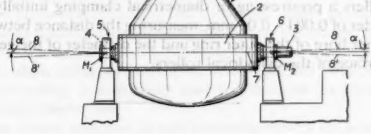


1. A self-dimensioning bearing assembly comprising a body of synthetic plastic material having inner and outer concentric cylindrical sleeves radially spaced from each other, said inner sleeve having elongated slots to form a plurality of resilient, flexible segments, radially extending webs connecting said inner and outer sleeves and support means for said bearing wherein the outer bearing sleeve is unconstrained against radial displacement for substantially its entire length.

3,910,653
SELF ADJUSTING TRUNNION BEARING SEAL ARRANGEMENT

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Austria

Filed Oct. 31, 1973, Ser. No. 411,429
Claims priority, application Austria, Jan. 30, 1973, 775/73
Int. Cl.² F16C *1/24, 33/76;* **F16J** *15/32, 15/38*
U.S. Cl. 308—36.1 **3 Claims**

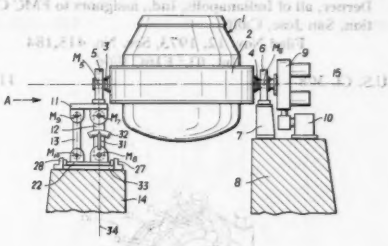


1. A bearing assembly for a carrying trunnion of a tiltable converter comprising,
a bearing mounted on said trunnion and adapted to accommodate angular and wobbling movements of said trunnion,
a bearing housing encircling said bearing,
a pair of annular cover portions on said housing depending radially inward of said housing on either side of said bearing, each of said cover portions having an inner annular face radially spaced from said trunnion,
a pair of spacer rings encircling said trunnion, one on either side of said bearing, to restrain said bearing against axial movement on said trunnion,
each of said spacer rings including a flange like portion have an outer annular face extending radially outward to a position such that said outer annular face is opposed to an inner annular face of a respective one of said covers,
the inner annular faces of said covers and the outer annular faces of said spacer rings being complementary spherical surfaces whose center is substantially at the center of said bearing,
and an annular sealing element disposed between each pair of opposed annular faces, said sealing elements being retained in annular recesses formed in at least one face of each pair.

3,910,654
BEARING CONSTRUCTION FOR TILTABLE CONVERTERS

Walter Schwarz, Linz; Ernst Riegler, Enns, and Manfred Schmidt, Linz, all of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed June 7, 1974, Ser. No. 477,175
Claims priority, application Austria, June 20, 1973, 5411/73
Int. Cl.² C21C *5/50*
U.S. Cl. 308—72 **9 Claims**



1. A bearing support structure for tiltable converters with turning and supporting trunnions lying opposite each other and being borne by bearings in bearing housings that accommodate angular and tumble movements, comprising:
a stationary support on which one bearing housing is mounted;
a link support on which the other bearing housing is mounted, said link support being articulately connected to the bearing housing;
a connecting rod arranged in parallel relation to said link support; and
means for articulately connecting said link support to said connecting rod in such a way as to keep them in parallel relation to each other.

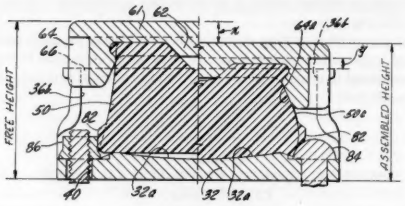
3,910,655
CONSTANT CONTACT SIDE BEARING

Donald Willison, Lyndhurst; Hans B. Weber, Bedford, and Joseph S. Deucher, Mayfield Heights, all of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Apr. 1, 1974, Ser. No. 456,540
Int. Cl.² B61F *5/14*
U.S. Cl. 308—138 **17 Claims**

1. A resilient side bearing for railway vehicles, comprising a housing having a base with sidewalls extending upwardly therefrom, a block member of resilient material in said housing and supported on said base, a cap member positioned on said block member for transmitting vertical loads thereto, said cap and block members having interlocking lug and pocket means for securing said cap member to said block member against detachment therefrom in vertical and horizontal direc-

tions, and means on said cap member adapted for wedging engagement with said block member, during securement of



the members, to deform said block member whereby said lug and pocket means are forced into interlocking engagement.

3,910,656

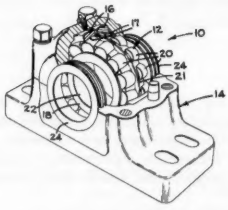
SPHERICAL ROLLER BEARING FOR HEAVY LOADS

Connor E. Price; Eugene E. Pfaffenberger, and William J. Derner, all of Indianapolis, Ind., assignors to FMC Corporation, San Jose, Calif.

Filed Nov. 12, 1973, Ser. No. 415,184

Int. Cl.[2] F16C *9/06*

U.S. Cl. 308—194 **11 Claims**



1. In a spherical roller bearing assembly having an outer bearing ring with a concavely curved raceway, an inner bearing ring with a concavely curved raceway, a plurality of spaced convexly crowned rollers mounted between the outer and inner rings and a cage separating the rollers circumferentially, the improvement which comprises said rollers having a continuous smooth curve generating an improved convexly crowned outer contact surface envelope as the roller rolls about its longitudinal axis, said smooth curve having a central portion of the roller's axial length with a convex radius substantially equal to the concave radius of the mating inner ring raceway and having end portions of decreased radius of curvature adjacent the longitudinal ends of the rollers, which end portions provide a predetermined osculation clearance between the roller and its mating raceway when unloaded which is proportional to the combined elastic deformation of the roller in contact with its mating raceway under the maximum design load of the bearing assembly, whereby high stress concentrations at the ends of the rollers are eliminated, the life and reliability of the bearing assembly over a wide range of loads are improved and the practical load limit of the bearing assembly is increased.

3,910,657

ROLLING MEMBERS PRESTRESSED BY A RADIALLY RESILIENT RING

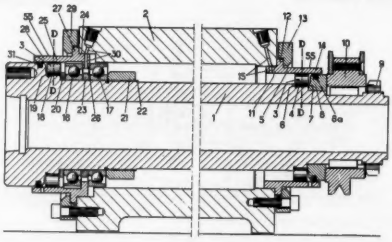
Daniel Dosne, Meudon, France, assignor to Societe Nouvelle de Roulements, Annecy, France

Filed Feb. 20, 1974, Ser. No. 444,224

Claims priority, application France, Mar. 26, 1973, 73.10823

Int. Cl.[2] F16C *33/58*

U.S. Cl. 308—216 **8 Claims**



1. An antifriction bearing of the type including at least one row of cylindrical rollers mounted for rotation between two inner and outer races, the inner race being rigid and the outer race being defined by and disposed substantially in the central portion of an elongated, substantially cylindrical resilient ring extending axially on either side of said inner race, said outer ring being rigidly mounted at one end and free at the other end and being radially deformable over a width at least about three times the length of the contact generatrix with the cylindrical rollers disposed in said central deformation portion of the elastic outer ring, said portion having a thickness e substantially satisfying the equation $e = 2.5 + 0.02\ \phi$ at the point of the contact surface of the cylindrical rollers, ϕ being the internal diameter of the deformable portion of the outer ring and all dimensions being in millimeters, the said deformable portion of the resilient outer ring exerting on the cylindrical rollers a prestressing or diametrical clamping initially of the order of 0.001 – 0.05 mm, measuring the distance between the inner bore of the outer ring and the diameter of the generated surface of the cylindrical rollers.

3,910,658

REFRIGERATION APPARATUS ENCLOSURE STRUCTURE

Robert E. Lindenschmidt, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

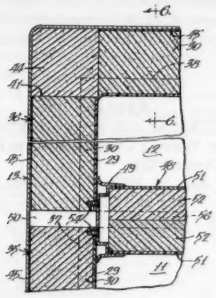
Filed Jan. 14, 1974, Ser. No. 433,070

Int. Cl.[2] A47B *71/00*; **B65D** *25/14*

U.S. Cl. 312—214 **21 Claims**

1. A refrigeration apparatus enclosure comprising: an outer cabinet; an inner laminate wall within said outer cabinet defined by an inner sheet liner and outer insulation extending between said inner sheet liner and said outer cabinet, said inner liner having at least one folded, continuous corner portion to conform the laminate to the contours of said outer

cabinet, said insulation being slit through to said liner at said folded liner portion to define a substantially square section



void outwardly of said folded liner portions; and insulation means filling said void.

3,910,659

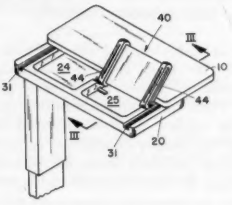
REVERSIBLE OVERBED TABLE AND MIRROR

Warren J. Peterson, Stevens Point, Wis., assignor to Joerns Furniture Company, Stevens Point, Wis.

Filed July 8, 1974, Ser. No. 486,468

Int. Cl.[2] A47B *23/00, 88/00*

U.S. Cl. 312—226 **11 Claims**



2. A reversible overbed table comprising:

a housing including at least one upwardly open recess;

a top member positioned over said housing;

means slidably mounting said top member over said housing, said means allowing sliding of said top member back and forth over said housing, allowing said top member to extend outward from said housing and including a channel member, said channel member being rigidly mounted on said top member and downwardly protruding therefrom and a corresponding track member rigidly mounted on said housing and upwardly projecting therefrom, said channel member slidably engaging said track member so as to allow sliding of said top member back and forth over said housing and allowing said top member to extend outward therefrom;

locking means attached to said mounting means for securing said table top in locked position over said housing to form said overbed table, said locking means when engaged preventing sliding of said top member along said housing and being releasable to allow slidable movement of said top member back and forth over said housing and said locking means including: U-shaped locking clips pivotally mounted on and extending from each end of said channel members, said locking clips downwardly pivoting around the end of the corresponding track member and including a bite portion engageable with the end of said track member, when said channel member and track member are generally aligned with each other, each of said locking clips being capable of preventing slidable displacement of said top member along said housing on the side of the top member said bite portion of said locking clip is pivoted into the plane of said corresponding track member; and

a mirror assembly included in said recess, said mirror assembly being accessible by displacing said top member with respect to said housing in any desired direction along said mounting means and said mirror assembly including: a mirror surface;

track members peripherally mounted on opposite side edges of said miror surface and including elongated indents therein and a pair of stud members, each stud member including a C-shaped portion and a mounting portion said stud members being mounted opposite to one another within the recess in said housing, each of said C-shaped portions of said studs being inserted in the indents in said track members so as to slidably mount said track members on said stud members and allowing horizontal displacement of said mirror in said recess along said track members and further allowing vertical rotation of said mirror surface along said stud members to expose said mirror surface.

3,910,660

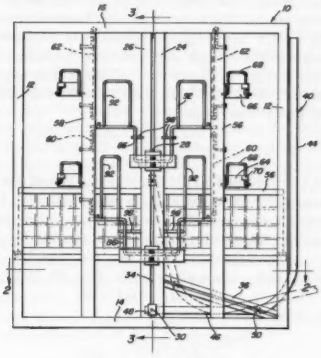
RACKS FOR BOTTLES, CANS AND GLASSES

Glennon P. Walter, P.O. Box 3, Perryville, Mo. 63775

Filed Nov. 22, 1974, Ser. No. 526,160

Int. Cl.[2] A47B *51/00, 81/00*

U.S. Cl. 312—312 **10 Claims**



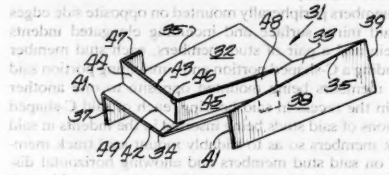
1. In combination, an upright open top support structure defining an elevator passage extending upwardly therein, said support structure including support means in a lower portion of said passage for supporting a rack therefrom, said support structure further including ratchet structure spaced vertically therealong for supporting a plurality of racks in vertically spaced relation within said passage against downward displacement therein and for substantially free upward displacement relative to said ratchet structure, elevator means guidingly supported from said rack structure for elevational shifting therealong, said elevator means including rack engaging means shiftable between operative rack engaging position and inoperative rack by-passing position, said rack engaging means and support structure including means for sensing a lower rack in said support structure below an upper rack and shifting said rack engaging means to the inoperative position while moving upwardly past said lower rack and to the operative position thereof when moving upwardly past the upper rack for supportively engaging the latter and elevating the same to the next higher ratchet structure for support therefrom in response to further upward movement of said elevator means.

3,910,661

SOAP HOLDER

William M. Geary, 9347 S. Crawford Ave., Evergreen Park, Ill. 60642

Filed Dec. 17, 1973, Ser. No. 425,501
Int. Cl.[2] A47B *88/00*
U.S. Cl. 312—351 **9 Claims**



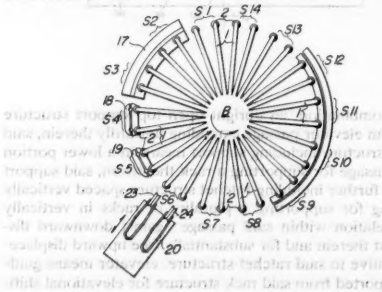
1. A receptacle for a bar of soap comprising a base forming a V-shaped trough downwardly and forwardly inclined with the lower front edge adapted to be positioned in substantial alignment with the edge of a ledge for a basin bowl, said base being formed of a pair of inwardly and downwardly inclined base sections intersecting at a centerline in an obtuse angle to provide the trough, a pair of depending legs of a generally trapezoidal shape integral with the base sections at the outer edges thereof, each leg extending the length of the edge of the base with the height of the rear edge of the legs being greater than the height of the leg front edge, and an upstanding soap retaining means extending substantially across the base and adapted to contact the soap bar at very limited areas, said soap retaining means being slightly spaced from the base at at least the center of the trough and generally inclined toward the centerline thereof to direct flow of water and soap suds into the center of the trough and then automatically downwardly over the lower front edge.

3,910,662

APPARATUS FOR PRODUCING FLUORESCENT LAMPS

Hinomaru Fujio, Neyagawa; Kazunori Fukunaga, Osaka, and Naoyuki Nakamura, Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Oct. 23, 1973, Ser. No. 408,534
Claims priority, application Japan, Dec. 29, 1972, 48-9619
Int. Cl.[2] H01J *9/38*
U.S. Cl. 316—30 **6 Claims**



1. An apparatus for producing annular fluorescent lamps comprising:

a turret which is intermittently rotated about its axis,

a plurality of supporting arms mounted on said turret for rotation therewith and extending radially outwardly therefrom,

exhaustion heads on the outer ends of said supporting arm for holding and supporting a plurality of glass tubes,

a plurality of work stations on the path of travel of the glass tubes, a first work station comprising a heating means, a second work station comprising a bending means for bending two next adjacent glass tubes supported by two next adjacent exhaustion heads substantially simultaneously, and a third work station comprising an exhausting means, and

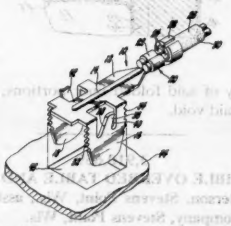
means interconnecting said first and second bending means for effecting the substantially simultaneous operation thereof.

3,910,663

ELECTRICAL GROUND TERMINAL

James L. Winger, Warren, Ohio, assignor to General Motors Corporation, Detoit, Mich.

Filed Apr. 22, 1974, Ser. No. 462,630
Int. Cl.[2] H01R *3/06*
U.S. Cl. 339—14 **2 Claims**



1. An electrical ground terminal adapted to be forcefully driven into an undersized hole extending through an electrically conductive support panel comprising:

a base,

a pair of spaced blades integral with said base and extending downwardly therefrom, each of said blades having sawtooth portions on at least a portion of one longitudinal facing end which sawtooth portions are adapted to scrape and cut the surface of an undersized hole extending through an electrically conductive support panel when said terminal is forcefully driven into said undersized hole so as to make an electrical and mechanical connection between the terminal and the support panel, and

at least one of said blades further having a resilient integral tang extending laterally outwardly from said blades and upwardly toward said base in a cantilevered fashion, said tang having a generally concave outer surface and a pair of sharp spaced edges for digging into a surface defining said undersized hole under the self biasing forces of said tang when said terminal is forcefully driven therein to provide additional points of contact between the terminal and the support panel and thereby improve the electrical connection therebetween.

3,910,664

MULTI-CONTACT ELECTRICAL CONNECTOR FOR A CERAMIC SUBSTRATE OR THE LIKE

William Vito Pauza, and Edward Michael Poltonavage, both of Palmyra, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

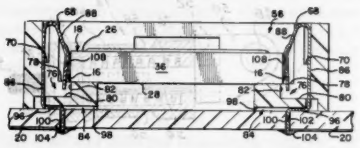
Continuation-in-part of Ser. No. 321,106, Jan. 4, 1973, abandoned. This application June 12, 1974, Ser. No. 478,473
Int. Cl.[2] H01R *13/54;* **H05R** *1/18*
U.S. Cl. 339—17 CF **2 Claims**

1. In combination with a panel-like member such as a substrate having circuit means on one face thereof and having conductors extending from the circuit means to and across the edges of the panel-like member, an electrical connector comprising:

a. an insulating housing having a central substrate-receiving area on one side thereof with the panel-like member being located therein with its conductor-carrying edges being positioned perpendicular to the plane of the receiving area;

b. a plurality of contact-receiving cavities extending vertically through said housing from one side to the other and disposed normal and in at least partially surrounding relationship to the central substrate-receiving area, said cavities being defined in part by a recess providing a shoulder facing toward the contact-receiving cavities and extending below the level thereof;

c. a plurality of electrical contact terminals each having a post portion and a spring portion and positioned in a cavity with the spring portion being nearest the central



substrate-receiving area with the free end of the spring portion extending into the recess whereby the shoulder flexes the spring portion into a pre-loaded condition, and with a part of the post portion depending from the housing; and

d. contact means on and integral with the spring portion of each of the contact terminals, said contact means being parallel to and in biasing engagement with the conductors on the edges of the panel-like member positioned in the central receiving area.

3,910,665

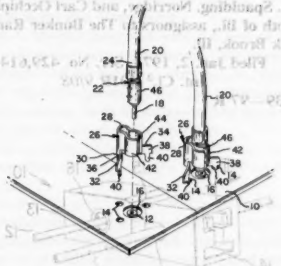
VERTICAL MOUNTED CIRCUIT BOARD CONNECTOR

Robert Stanley Stull, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 423,941, Dec. 12, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 548,055

Int. Cl.[2] H05K *1/00;* **H01R** *17/18*

U.S. Cl. 339—17 C **2 Claims**



1. An electrical connector apparatus; comprising:

a. a coaxial cable having a braided outer shield, a center conductor and a dielectric between the shield and center conductor;

b. a terminal member having a portion crimped around the braided shield of said cable;

c. a circuit board;

d. a connector having a first tubular sleeve carrying leg members thereon, said leg members attached to the circuit board, and a second tubular sleeve parallel to the first and integral therewith, said second sleeve resiliently engaging said portion of the terminal engaging the braided shield and the center conductor of the cable extending into the circuit board.

3,910,666

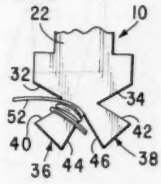
ELECTRICAL TERMINAL AND METHOD OF FORMING AN ELECTRICAL CONNECTION THEREWITH

Harold A. McIntosh, Los Angeles, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed July 27, 1973, Ser. No. 383,204

Int. Cl. H01r *11/08*

U.S. Cl. 339—276 T **8 Claims**



1. An electrical terminal comprising

a strip of electrically conductive material having a first edge;

a first ductile member extending from said first edge, said first ductile member having a second edge adapted to have a lead wire wrapped therearound;

said strip having a third edge;

a second ductile member extending from said third edge, said second ductile member having a fourth edge adapted to have another lead wire wrapped therearound;

the first and second ductile members being bendable toward the first and third edges to clamp the second edge against the first edge and the fourth edge against the third edge; said second edge of said first ductile member and said fourth edge of said second ductile member being deformable to accommodate lead wires wrapped around said first and second ductile members as said first and second ductile members are bent toward the first and third edges, said second edge is clamped against said first edge and said fourth edge is clamped against said third edge; and said first and second ductile members having wedge-like configurations, the narrower end of each of one of said first and second ductile members being joined to said strip of electrically conductive material.

3,910,667

ELECTRICAL SUPPLY INSTALLATIONS

Robert Heritage, London, England, assignor to Rotaflex (Great Britain) Limited, London, England

Filed July 13, 1973, Ser. No. 379,079

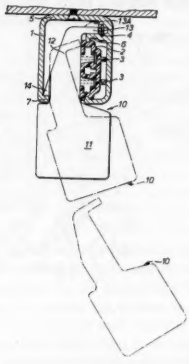
Claims priority, application United Kingdom, July 21, 1972, 34148/72

Int. Cl.[2] H01R *13/54*

U.S. Cl. 339—22 R **8 Claims**

1. An adaptor for use with an electrical supply, channel section track of the continuous outlet type, comprising an insulated body having a nose portion a plurality of contacts mounted in said nose portion and movable in a plane between inoperative retracted positions and operative extended positions in which said contact members project laterally of said nose portion, a laterally projecting hook portion on said nose portion adapted to engage a first co-operating support in said track channel by insertion of said nose portion into said channel section and concomitant tilting of said adaptor about an axis parallel with the length of said channel and parallel with said plane, and releasable latching means being movable into and out of co-operating engagement with a second co-operating support of said track channel offset from the first with respect to the axis about which the adaptor tilts, said latching

means extending, in its position of co-operating engagement in a lateral direction opposite to the lateral direction of projection of said hook portion to prevent inadvertent tilting of said adaptor out of its engaged position.



3,910,668

SOCKET FOR LIGHT BULB WITHOUT THREADED BASE

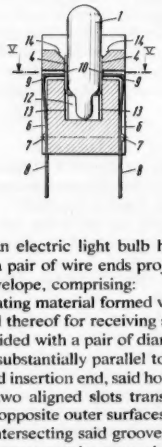
Albert Wasmeier, Vorberg, Germany, assignor to RAFI Raimund Finsterholzl Elektrotechnische Spezialfabrik, Ravensburg, Germany

Filed Feb. 20, 1974, Ser. No. 443,955

Claims priority, application Germany, Mar. 1, 1973, 2310151

Int. Cl.² H01R *13/20*

U.S. Cl. 339—65 **5 Claims**



1. A socket for an electric light bulb having an elongate glass envelope and a pair of wire ends projecting from opposite sides of said envelope, comprising:

a housing of insulating material formed with a bore open at an insertion end thereof for receiving said envelope, said bore being provided with a pair of diametrically opposite lateral grooves substantially parallel to the bore axis and open toward said insertion end, said housing being further provided with two aligned slots transverse to said axis extending from opposite outer surfaces of said housing to said bore and intersecting said grooves; and

a pair of resilient contact tabs secured to said housing at said outer surfaces and terminating in bent-over extremities yieldably traversing said slots and extending toward said axis across said grooves in the absence of said envelope for conductive engagement with said wire ends upon insertion of said envelope into said bore with said wire ends bent back axially against said envelope and received in said grooves.

3,910,669

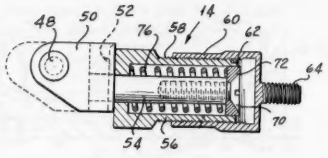
SELF-COMPENSATING ADJUSTABLE KEEPER

Edward MacMaster, New Milford, N.J., assignor to Rex Chainbelt Inc., Milwaukee, Wis.

Continuation of Ser. No. 286,327, Sept. 5, 1972, abandoned, which is a continuation of Ser. No. 107,755, Jan. 19, 1971, abandoned. This application Nov. 12, 1973, Ser. No. 414,849

Int. Cl.² H01R *13/54*

U.S. Cl. 339—75 R **6 Claims**



1. A self compensating adjustable keeper assembly for use with a latch operated to engage a keeper to move a member from an out-of-home position on a support to a home position on said support including in combination, a keeper engaged by said latch, a two-part assembly mounting said keeper on said support, means fixedly securing one of said parts to said support independently of said other part, means mounting said keeper on the other part for sliding movement from a retracted position to an extended position in response to operation of said latch, a spring biasing said keeper to said retracted position, and interengageable screw threads continuous around each of said first and second parts, said screw threads permitting relative rotary movement of said parts around an axis to an ajusted position of said other part relative to said fixedly secured part and of said keeper relative to said support prior to operation of said latch while preventing relative movement of said parts in response to an axial force to secure said parts to each other in a fixed relative position prior to and independently of the operation of said latch.

3,910,670

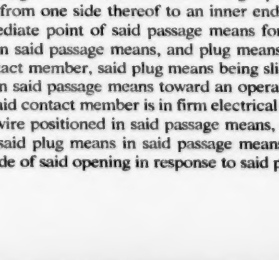
ELECTRICAL CONNECTORS WITH INSULATION PIERCING CONTACTS

Tedford H. Spaulding, Norridge, and Carl Occhipinti, Melrose Park, both of Ill., assignors to The Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jan. 2, 1974, Ser. No. 429,614

Int. Cl.² H01R *9/08*

U.S. Cl. 339—97 R **13 Claims**



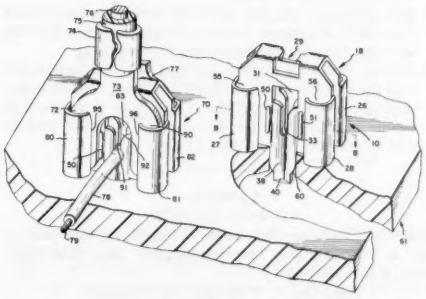
9. An electrical connector for establishing an electrical connection to an insulated wire, comprising: receptacle means having passage means therein and having opening means extending from one side thereof to an inner end intersecting an intermediate point of said passage means for positioning said wire in said passage means, and plug means including a metal contact member, said plug means being slidable in one direction in said passage means toward an operative position in which said contact member is in firm electrical engagement with said wire positioned in said passage means, means movable with said plug means in said passage means for closing said one side of said opening in response to said plug member

moving to a first predetermined position in said passage means, said contact member having a pair of spaced parallel aligned leg portions and a bight portion interconnecting base ends of said leg portions, said leg portions being adapted to embrace said wire therebetween and to cut through the insulation on said wire into engagement with said wire in response to the movement of said plug means past said first predetermined position to a second predetermined position, said plug means further including a support member of insulating material having a pair of arm portions extending along the outside of said contact member leg portions, said contact member leg portions having out-turned terminal ends, and one of said support member arm portions having snap-lock means for engaging the out-turned terminal end of said adjacent contact member leg portion to hold said contact member in said support member.

3,910,671
PRINTED CIRCUIT BOARD TERMINAL RECEPTACLE

Peter Keith Townsend, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 2, 1974, Ser. No. 430,371
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—97 R **10 Claims**



1. A contact constructed to be securely mounted upon a board, and to receive both bifurcated spade terminals and ends of conductors, and comprising:

a generally U-shaped structure with the legs of the U comprising a first element and a second element, with both said first and second elements comprising parallel central portions which are generally flat and rectangular in shape and further being, both in structure and in position, substantially mirror images of each other;

a transverse portion connecting said first and second elements together to complete the generally U-shaped configuration;

each of said first and second elements having securing elements extending from the free end thereof, with each securing element having two side edges and being generally convex in shape with respect to, and further being positioned oppositely to the securing element of the other element to provide a predetermined spacing between said flat, rectangular central portion;

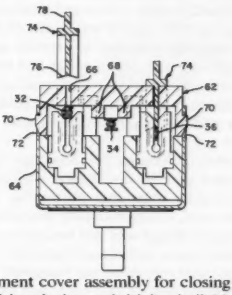
each of said two securing elements being of a size to have the four side edges thereof press firmly against the walls of a hole in said circuit board in which they are inserted, and to thereby secure said contact to said circuit board;

each of said first and second elements further having the two side edges thereof bent back and towards each other in a direction away from the other element to form a pair of parallel, elongated slots, with the bent back portions having a curved cross-sectional area, with the concave side thereof facing the flat rectangular central portion to provide a spring-like force upon the legs of a bifurcated spade terminal insertable therein.

3,910,672
REPLACEMENT COVER FOR ELECTRICAL WIRING DEVICES

Robert Houston Frantz, Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 3, 1974, Ser. No. 475,537
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—97 P **8 Claims**



8. A replacement cover assembly for closing an opening in an electrical wiring device and driving individual conductors of electrical cables fed to the device into slotted beam contacts fixed in the device, said cover assembly comprising:

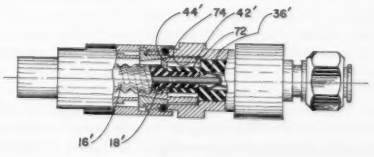
a cover member having a plurality of profiled apertures therein, each said aperture positioned to lie above a respective one of said slotted beam contacts, means for lockingly securing said cover on said device, and means insuring unidirectional engagement of said cover on said device; and

a like plurality of profiled termination plugs each adapted to be loosely inserted into one of said apertures, one end of each said plug having a concave configuration for centering the underlying conductor and driving it into the associated slotted beam, and integral locking lance means lockingly securing said plugs into said cover member in the fully inserted position.

3,910,673
COAXIAL CABLE CONNECTORS

Danny Burton Stokes, Las Vegas, Nev., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 18, 1973, Ser. No. 398,363
Int. Cl.[2] H01R *17/04*
U.S. Cl. 339—177 R **1 Claim**



1. In a connector for coaxial cables of the RF type, a combination which permits one connector to be suitable for use on a group of cables having the same impedance characteristics and similar nominal size but different structural details while reducing the number of loose components thereof in order to facilitate its connection onto a cable, said combination comprising:

a. a body having an inner conductor and outer conductor and dielectric therebetween arranged at its forward end for connection with another connector and at its rear end for receiving any one of said group of cables, the outer conductor and some of the dielectric of said cable being

removed from a forward portion thereof and said dielectric of said body extending rearwardly over said exposed dielectric of said cable to provide a voltage standoff, and screw threads on the rear end of said outer conductor for connection to a backshell,

b. a collet and collet clamp pair positioned at the rear end of said body for applying clamping force upon the outer conductor of said cable in the radially inward direction, only, upon axially forward movement of said collet clamp relative to said collet, a forward portion of said collet extending over said tubular extension of the dielectric of the body being dimensioned to provide an annular space between said portion of the collet and said extension of the dielectric to provide adjustment of the dielectric value of the space between the outer surface of the inner conductor and the inner surface of said portion of said collet, and

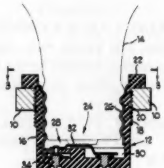
c. a subassembly including a backshell having screw threads at its forward end for connection with said body and a radially inwardly extending portion at its rear end, a deformable seal, a longitudinally extending spacer positioned forward of said seal and means for captivating said seal and said spacer within said backshell, the dimensions of the captivated members and backshell being such that upon the connection of said backshell to said body, said spacer is forced against said seal thereby deforming said seal against said cable to make sealing contact with said cable.

3,910,674

LIGHT BULB SOCKET

Sam J. Cottone, Addison, and Leonard F. Futia, Arlington Heights, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Sept. 12, 1973, Ser. No. 396,604
Int. Cl.[2] H01R *17/20*
U.S. Cl. 339—180 **3 Claims**



1. A lightbulb socket comprising:

an outer casing having an interior forming a cup for receiving an end of a lightbulb therein;

a longitudinal wall forming the interior of said cup having a side contact electrically connectable to an electrical power source; and

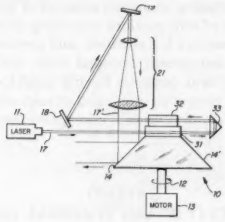
a compressible removably mounted generally U-shaped base member forming the bottom of said cup including a bight portion having a base contact mounted thereon which is electrically connectable to an electrical power source, and two leg portions which are resiliently movable toward each other, whereby said base member is removable when said leg portions are moved toward each other.

3,910,675

LASER SCANNING APPARATUS

Alan John MacGovern, Acton, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Nov. 4, 1974, Ser. No. 520,762
Int. Cl.[2] H02B *27/17*
U.S. Cl. 350—7 **14 Claims**



1. In a light scanning apparatus including:

a. means for producing a light beam;

b. beam deflector means positioned in the path of said light beam, said beam deflector means having at least one beam deflecting face; and,

c. drive means for moving said beam deflecting face of said beam deflector means across said light beam to effect the scanning thereof; the improvement comprising:

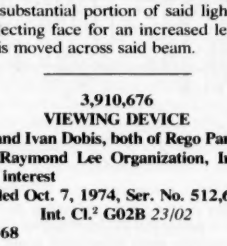
d. shifting means for shifting said light beam in conjunction with the movement of said beam deflecting face for maintaining a substantial portion of said light beam on said beam deflecting face for an increased length of time as said face is moved across said beam.

3,910,676

VIEWING DEVICE

Frank Fojtik, and Ivan Dobis, both of Rego Park, N.Y., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 7, 1974, Ser. No. 512,666
Int. Cl.[2] G02B *23/02*
U.S. Cl. 350—68 **2 Claims**



1. A viewing device for a door, comprising

a first tubular member extending through a door and having a predetermined diameter;

a second tubular member having a smaller diameter than the predetermined diameter coaxially positioned inside the first tubular member;

a substantially hollow hemispherical portion extending from the end of the second tubular member outside the door, the hemispherical portion having an outside convex surface covered with light reflective material;

a viewing lens mounted in the hemispherical portion in the plane of a major diameter thereof substantially perpendicular to the axis of the tubular members; and

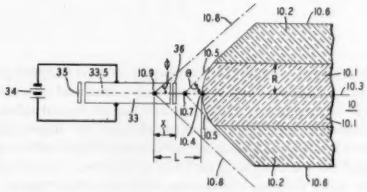
mounting means slidably mounting the second tubular member for movement in axial directions in the first tubular member in a manner whereby when the second tubular member is positioned with the outside surface of the hemispherical portion thereof in substantial abutment with the end of the first tubular member outside the door, a viewer inside the door sees directly through the second tubular member and when the second tubular member is positioned with the outside surface of the hemispherical portion thereof spaced from the end of the first tubular member outside the door, a viewer inside the door sees anything reflected from the outside surface of the hemispherical portion through the first tubular member.

3,910,677

HYPERBOLIC TYPE OPTICAL FIBER LENS COUPLER FOR COUPLING THE FIBER TO AN OPTICAL LINE SOURCE

Edward Eugene Becker, High Bridge, and Kaneyuki Kurokawa, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 13, 1974, Ser. No. 469,064
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96 C **6 Claims**



1. An optical fiber having a core region for propagating optical radiation and having an end surface whose intersection with a measuring (imaginary) plane surface containing a central axis of the fiber is chararcterized by a larger paraxial maximium curvature (smaller paraxial radius of curvature) than peripheral maximum curvature, the said maximum (with respect to rotations of the measuring plane) curvature at the central axis of the fiber being an absolute maximum and the said curvature monotonically tapering off to a minimum at the periphery of the core region of the fiber, such that the end surface is substantially in the form of a hyperbola in said plane surface, so that the end surface can couple optical radiation from an optical source into the fiber for propagation therethrough.

3,910,678

FIBER OPTIC TUBULAR STAR CONNECTOR

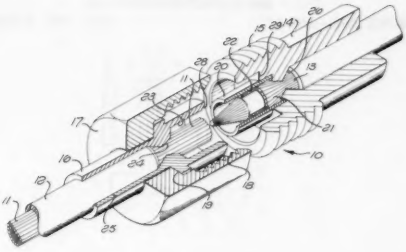
Ronald L. McCartney, Orange, and Eleanor A. Landgreen, Temple City, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 22, 1974, Ser. No. 526,270
Int. Cl.[2] G02B *5/16*
U.S. Cl. 350—96 C **10 Claims**

1. A fiber optic connector for dismountably joining at least first and second fiber optic cables each including a fiber bundle having a plurality of individual light transmissive fibers, said connector including first and second mateable connector shells in which said first and second cables are respectively secured and positioned colinearly, comprising the combination of:

an axially elongated spindle having an axially defined central portion and first and second tapered end portions the surfaces of said spindle ends converging substantially to corresponding points on the axis of said colinearly positioned cables;

an optical interface element comprising an annular sleeve of a transparent elastomer material positioned about said spindle central portion and having an axial dimension at least a fraction of the axial dimension of said central portion;



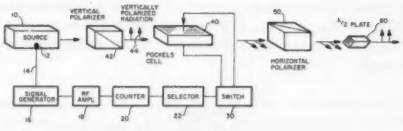
means for mechanically securing the outside circumferential surface of said interface element with respect to one of said connector shells, thereby to provide distribution of the fibers of said cables over the surface of said spindle tapered end portions to bring said fibers into axial contact each with a corresponding axially facing end of said interface element in a single circumferential fiber layer.

3,910,679

SINGLE PULSE SELECTION SYSTEM

Paul M. Rushworth; Robert W. McMillan, and Vincent J. Corcoran, all of Orlando, Fla., assignors to Martin-Marietta Corporation, Orlando, Fla.

Filed Nov. 14, 1973, Ser. No. 415,608
Int. Cl.[2] G02F *1/03*
U.S. Cl. 350—150 **17 Claims**

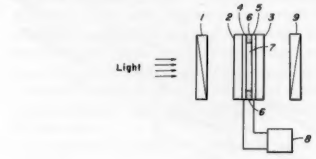


1. A high speed pulse selection device usable with a source of monochromatic collimated radiation that is supplying a train of closely spaced optical pulses, said device comprising a shutter capable of being disposed in the path of such radiation, said shutter having an electro-optic portion and an electronic portion, with said shutter being located such that the radiation is directed onto said electro-optic portion, and timing means connected so as to control the electronic portion of said shutter such that the electro-optic portion of said shutter can be momentarily opened in response to a stimulus from said timing means, said timing means including selector means serving to enable the selection of a single pulse from such pulse train, said timing means being operatively connected to the source of radiation and deriving synchronization therefrom, the natural frequency of the source of radiation being the repetition frequency of the output pulse train, said timing means serving to control said electronic portion of said shutter such that the electro-optic portion of said shutter will be opened at a time which coincides with the arrival of said electro-optic portion of a selected pulse from the source of radiation, so that such selected pulse can be transmitted to a point of use.

3,910,680
ELECTRICAL OPTICAL MODULATOR

Teruyuki Kakeda, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1973, Ser. No. 412,813
Claims priority, application Japan, Nov. 16, 1972, 47-115299
Int. Cl.² G02F 1/16
U.S. Cl. 350—160 LC 1 Claim



1. In an electric optical modulator including a nematic liquid crystal cell disposed in the optical path of a polarizer and an analyzer having planes of polarization at right angles to each other, the combination comprising:

a nematic liquid crystal layer having an electric dipole normal to the long axial direction of the crystal molecules;

a pair of parallel transparent electrodes having the liquid crystal disposed therebetween in a manner such that the long axial direction of the crystal molecules is normal to the adjacent surfaces of the electrodes;

a control circuit for imposing an electric field to said nematic liquid crystal layer through said pair of parallel transparent electrodes making said nematic liquid crystal layer preferably reorientate;

a spacer controlling the thickness L of said nematic liquid crystal layer in accordance with the following equation,

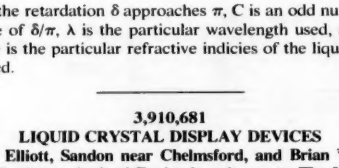
$$\cong \delta \frac{\lambda}{2\pi\,(Ne-No)} \cong \frac{C\,\lambda}{2(Ne-No)}$$

where the retardation δ approaches π, C is an odd numbered miltiple of δ/π, λ is the particular wavelength used, and No and Ne is the particular refractive indicies of the liquid crystals used.

3,910,681
LIQUID CRYSTAL DISPLAY DEVICES

George Elliott, Sandon near Chelmsford, and Brian William Ely, Braintree, both of England, assignors to The Marconi Company Limited, Chelmsford, England

Filed Jan. 11, 1974, Ser. No. 432,583
Claims priority, application United Kingdom, Jan. 11, 1973, 1481/73
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC 16 Claims

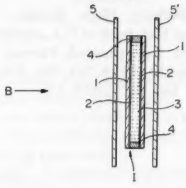


1. A liquid crystal display device operating by reflection for radiant energy within a given spectral range and including a front plate and a reflective mirror with a layer of liquid crystal material therebetween, wherein the reflective mirror is a dielectric mirror consisting of layers of material of different refractive indices the thicknesses of which are such that the mirror is substantially transparent for said radiant energy which is incident at angles close to normal incidence and is substantially reflective for said radiant energy which is incident at other angles.

3,910,682
LIQUID CRYSTAL CELLS

Yoshi Arai, Oyama; Shoichi Kinoshita, Omiya, and Kazuo Kimura, Tokyo, all of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo, Japan and Dainippon Ink Institute of Chemical Research, Japan

Filed July 11, 1973, Ser. No. 378,242
Claims priority, application Japan, July 15, 1972, 47-70429
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC 9 Claims

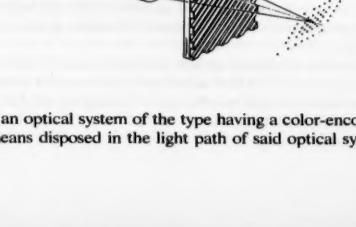


1. In a liquid crystal cell composed of two support plates which are arranged in parallel to each other and at least one of which is transparent, and a nematic liquid crystal substance filled between said two support plates; the improvement wherein a coating of a fluorine-containing surface active agent is formed on the opposing surfaces of the two support plates wherein said fluorine-containing surface active agent is a compound having a fluoro-carbon group of formula $-C_nF_{2n+1}$ wherein n is 5 to 10 as a hydrophobic atom group and a cationic atom group selected from the group consisting of $-N^+(R^1)_3.X^-$ wherein R^1 is a lower alkyl group and X is an acid group as a hydrophilic atomic group and $-N(R^3)_2.HX$ wherein R^3 is a lower alkyl group and X is a halogen atom as a hydrophilic atomic group.

3,910,683
OPTICAL LOW-PASS FILTER

Hisashi Nishino; Teruo Hosokawa, both of Sakai, and Ikuro Hioki, Kishiwada, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 164,757, July 21, 1971, Pat. No. 3,768,888. This application July 13, 1973, Ser. No. 379,013
Claims priority, application Japan, July 28, 1970, 45-65418The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.
Int. Cl.² G02B 5/18
U.S. Cl. 350—162 SF 3 Claims



1. In an optical system of the type having a color-encoding filter means disposed in the light path of said optical system

and serving to spatially modulate at least two color images, the optical system comprising filter means including a plurality of sets of laminae for introducing phase retardation, laminae in each set being arranged in parallel with each other and disposed at an angle to the laminae of at least one other set, and laminae in a set having the same size to provide phase retardations selected from the range given by the following formula:

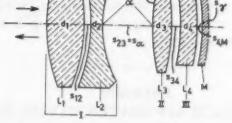
$$1-0.35\ (q+1) \quad \cos\delta \quad 1-0.65\ (q+1)$$

wherein q is the ratio equal to the total sum of areas not covered by said laminae divided by the total sum of areas covered by the laminae, said ratio being not less than 1, each set of laminae being respectively mounted on a transparent base plate to form a low-pass filter, and an objective lens on both sides of which the low-pass filters are disposed perpendicularly to the optical axis of the objective lens.

3,910,684
MIRROR-LENS OBJECTIVE

Erhard Glatzel, Heidenheim, Germany, assignor to Carl Zeiss-Stiftung, Oberkochen, Germany

Filed Sept. 16, 1974, Ser. No. 506,521
Claims priority, application Germany, Oct. 6, 1973, 2350281
Int. Cl.² G02B 17/08
U.S. Cl. 350—199 **25 Claims**



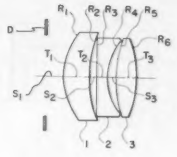
1. A multi-lens mirror-lens objective for forming an image on the same side of the objective as the object, at a finite image-forming scale, said objective comprising a collecting mirror (M) at one end of the objective and concave toward the opposite end of the objective, an inner lens member (H) in front of the mirror, and an outer lens member (A) spaced forwardly from the inner lens member, the light rays passing through said inner and outer lens members twice, once when passing inwardly toward said mirror and a second time when passing forwardly after reflection by said mirror, said mirror, inner lens member, and outer lens member being so formed and dimensioned that

a. the inner lens member has a collecting action and the sign of the focal length of the inner lens member is positive;
b. the quotient of the paraxial focal length (f_H) of the inner lens member (H) divided by the paraxial focal length (f_M) of the mirror (M) is within the range limits of + 0.420 and + 2.860, both of such focal lengths being calculated with respect to a single ray passage through the medium of air;
c. the quotient of the paraxial refractive power (Φ_A) of the outer lens member (A) divided by the paraxial reflective power (ϕ_M) of the mirror (M) is within the range limits of + 0.479 and − 1.129, the power Φ_A being calculated with respect to a single ray passage and the paraxial reflective power ϕ_M being taken as the reciprocal of the paraxial focal length (f_M) of the mirror; and
d. the outer lens member (A) contains a negative component (N) which gives an over-correcting action, and the quotient of the negative focal length (f_N) of the negative component (N) divided by the focal length (f_M) of the mirror has a negative value within the range limits of − 0.137 and − 0.614.

3,910,685
THREE ELEMENT OBJECTIVE LENS WITH ASPHERES ON REAR SURFACES OF FIRST AND SECOND ELEMENTS

Donald DeJager, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,225
Int. Cl.² G02B 3/04, 9/16, 13/18
U.S. Cl. 350—226 **2 Claims**



1. A three element lens comprising a front positive element, a middle negative and a rear positive element, said lens having aspheric surfaces on the rear of said front and middle elements and wherein said lens has a focal length of 10.00mm when constructed according to the following parameters:

Element	N	V	Radius mm	Thickness or Separation mm
				S_1=1.800
1	2.01940	34.21	R_1=6.0159	T_1=2.550
			R_2=Asphere	S_2=.550
2	2.00000	18.80	R_3=Plano	T_2=1.000
			R_4=Asphere	S_3=.800
3	2.01940	34.21	R_5=11.166	T_3=1.850
			R_6=−9.9168	

wherein, from front to rear, the elements are numbered from 1 to 3, the corresponding indices of refraction, N, and Abbé numbers, V, are listed for each element, the radii of curvature of the surfaces are numbered from R_1 to R_6, the thicknesses of the elements are numbered from T_1 to T_3, the spacings between the diaphragm and the elements are numbered from S_1 to S_3, and wherein R_2 and R_4 represent the radius of curvature at the vertex of an aspheric surface defined by the following formula and parameters:

$$X=\frac{Cy^2}{1+\sqrt{1-(1+K)C^2y^2}}+Dy^4$$

Surface	R	K	D
2	20.644	0	1.355×10^{-4}
4	4.1152	−1.4	0

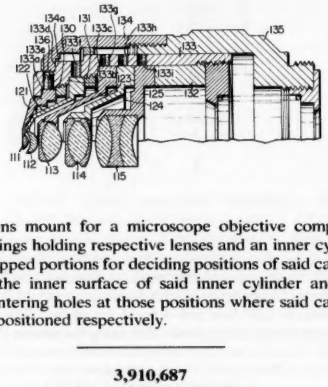
wherein x is the sag of an aspheric surface from a plane reference surface at a radial distance y from the axis of the lens, C is equal to the reciprocal of the vertex radius of curvature R and K is the conic constant.

3,910,686

LENS MOUNT FOR A MICROSCOPE OBJECTIVE

Takasi Nitami, Irima, and Yosikazu Ito, Hachiouji, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Jan. 18, 1974, Ser. No. 434,646
Claims priority, application Japan, Nov. 8, 1973, 48-124915; Jan. 25, 1973, 48-9947
Int. Cl.[2] G02B 7/02
U.S. Cl. 350—252 3 Claims



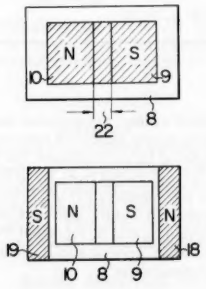
1. A lens mount for a microscope objective comprising carrying rings holding respective lenses and an inner cylinder having stepped portions for deciding positions of said carrying rings on the inner surface of said inner cylinder and also having centering holes at those positions where said carrying rings are positioned respectively.

3,910,687

LIGHT CONTROL DEVICE

Hiroshi Iwata, Osaka, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

Filed Aug. 16, 1973, Ser. No. 388,763
Claims priority, application Japan, Aug. 18, 1972, 47-83036; Sept. 20, 1972, 47-94763; Sept. 20, 1972, 47-94764; Sept. 20, 1972, 47-94765; Oct. 12, 1972, 47-102529
Int. Cl.[2] G02B 9/14
U.S. Cl. 350—267 8 Claims



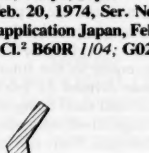
1. A light exposure control device comprising:
a hermetically sealed container having a front surface and a back surface with respect to the passage of incident light and containing an immiscible fluid transparent to light and a non light transmitting magnetic colloidal fluid including an activiated magnetic material,
means for locating, a light-sensitive member adjacent the back surface of said container, and
means for generating a magnetic field in close proximity to said container to shift the position of said magnetic fluid out of the light passage in said container, said light-sensitive member being exposed to light through said immiscible fluid or shielded therefrom by said colloidal fluid in accordance with whether said magnetic field is being generated.

3,910,688

REAR-VIEW MIRROR WITH REFLECTIVE COATING ON FLEXIBLE STRIP FOR AUTOMOBILE

Makoto Yamashita, Kanagawa, Japan, assignor to Ichikoh Industries Limited, Tokyo, Japan

Filed Feb. 20, 1974, Ser. No. 444,545
Claims priority, application Japan, Feb. 22, 1973, 48-20696
Int. Cl.[2] B60R 1/04; G02B 5/08
U.S. Cl. 350—278 6 Claims



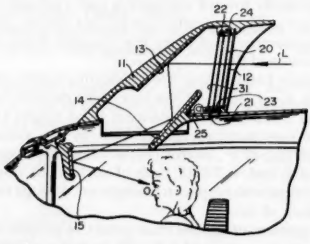
1. A rear view mirror for an automobile comprising:
a mirror strip of flexible, transparent material having a reflective surface coating;
a mirror housing surrounding said mirror strip, said housing having an opening therein directed toward the inside of said automobile;
roller means within said mirror housing engaged with said mirror strip for stretching and rotating said mirror strip across said opening; and
backing means within said mirror housing behind said mirror strip and said opening for providing a solid surface behind said mirror strip.

3,910,689

REAR VIEW MIRROR APPARATUS HAVING ROLL-TYPE FILTER MEANS FOR AUTOMOBILE

Makoto Yamashita, Kanagawa; Masagoro Kushida, Isehara; Fumio Niitsuma, Hatano; Masao Enomoto, Yokohama, and Akira Miyamoto, Tokyo, all of Japan, assignors to Ichikoh Industries Limited, Tokyo, Japan

Filed Feb. 5, 1974, Ser. No. 439,768
Claims priority, application Japan, Feb. 7, 1973, 48-14813
Int. Cl.[2] G02B 5/08
U.S. Cl. 350—302 5 Claims



1. In a rear view mirror apparatus for an automobile comprising:
a rear view mirror housing installed in the driver's chamber, a reflecting mirror mounted in the housing for receiving and reflecting light images, and filter means mounted within the housing in the path of light images received by and reflected from said mirror for filtering said images;
said filter means including a pair of reeling members, a tensioning means associated with said reeling members for urging said members apart, a flexible light-transmitting ribbon extending between said members for being

reeled and unreeled to present different portions having different light transmittances thereof to said light images, a motive power generating means actuated by a power source coupled operatively to said reeling members for causing reeling and unreeling;

the improvement wherein said tensioning means comprises a pair of tension rolls and a compressible spring means for supporting and biasing one of said tension rolls away from the other, and said tension rolls are disposed in the upper and lower foreground of said reflecting mirror, respectively, so as to locate and hold that portion of said ribbon applied between said tension rolls in front of said reflecting mirror, in a tensioned condition and in such a relationship that said portion of said ribbon is inclined with respect to the surface of said reflecting mirror, thereby controlling the amount of light rays reflected at said reflecting mirror and at the same time preventing those light rays reflected at the surface of said portion of said ribbon from impinging onto the eyes of the driver of the automobile.

3,910,690
METHOD AND APPARATUS FOR DETERMINING VISUAL ACUITY IN A HUMAN SUBJECT

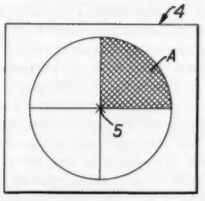
David Regan, Newcastle-under-Lyme, England, assignor to Wilkinson Sword Limited, London, England

Continuation of Ser. No. 328,781, Feb. 1, 1973, abandoned. This application June 19, 1974, Ser. No. 480,886

Claims priority, application United Kingdom, Feb. 2, 1972, 4866/72

Int. Cl.[2] A61B *3/02*

U.S. Cl. 351—31 **29 Claims**



1. A method of testing visual acuity in a human subject, comprising the steps of

presenting a continuous fixation mark to the subject in his visual field,

sequentially presenting to the subject, while he is fixating on the fixation mark, a plurality of visual images, each image being presented for a brief and constant length of time and part only of the said image comprising a pattern of regular variations between two visually constrasting levels, the said pattern being in a selected and randomised position relative to the fixation mark, and

maintaining the mean luminance of each said pattern to be substantially identical with the mean luminance of the remainder of each image, and

for each presentation, changing a visually sensible parameter of the pattern compared with the previous presentation.

3,910,691
OPHTHALMIC LENSES WITH PROGRESSIVELY VARYING FOCAL POWER

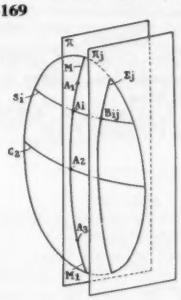
Bernard F. Maitenaz, Joinville-le-Pont, France, assignor to Essilor International, Joinville-le-Pont, France

Filed July 23, 1973, Ser. No. 381,476

Claims priority, application France, July 26, 1972, 72.26947

Int. Cl.[2] G02C *7/06*

U.S. Cl. 351—169 **2 Claims**



1. In an ophtalmic lens having a progressively variable focal power, and comprising a refracting surface with a generally vertical umbilical meridian curve having a radius of curvature the value of which progressively varies according to a predetermined law at least between one point of said meridian curve called distant-vision center, and another point of said curve called close-vision center, to provide a desired power addition along said meridian curve between said distant-vision and close-vision centers, said refracting surface having at each point of said meridian curve two main radii of curvature having identical values, said refracting surface further comprising a curve intersecting said meridian curve at right angles and lying in a plane also at right angles to said meridian curve, said intersecting curve being of substantially circular shape with a radius having a value equal to that of the radius of curvature of the meridian curve at the point of intersection of said meridian curve with said curve of substantially circular shape, and dividing said refracting surface into a first surface portion in which the value of the radius of curvature of the meridian curve decreases in the direction away from said point of intersection and a second surface portion in which the value of the radius of curvature of the meridian curve increases in the direction away from said intersection point, the sections of said first surface portion through planes at right angles to the meridian curve being non-circular curves intersecting said meridian curve at respective points of intersection, each of said non-circular section curves having a radius of curvature the value of which at the respective point of intersection with the meridian curve is equal to that of the radius of curvature of the meridian curve at said respective point of intersection and which increases from said value of the radius of curvature at the respective point of intersection in the direction away from said respective point of intersection, whereas the sections of said second surface portion through planes at right angles to the meridian curve are other non-circular curves intersecting said meridian curve at other respective points of intersection, each of said other non-circular section curves having a radius of curvature the value of which at the respective point of intersection with the meridian curve is equal to that of the radius of curvature of the meridian curve at said respective point of intersection and which decreases from said value of the radius of curvature at the respective point of intersection in the direction away from said respective point of intersection, the improvement consisting in that, at each point B_U of said aspheric surface, the section of said aspheric surface through a substantially vertical plane parallel to the plane of the generally vertical umbilical meridian curve is a curve of which the curvature C_B at said point B_U complies with the relationship:

$$|C_{B_{ij}} - C_{A_i}| \leq N$$

wherein C_{A_i} is the curvature of said umbilical meridian curve at a point A_i of said meridian curve which lies on a same horizontal section as said point B_{ij} of the aspheric surface when the lens is in its position of use, and N is a number having a predetermined value complying with the relationship:

$$N \leq 3.5\ A$$

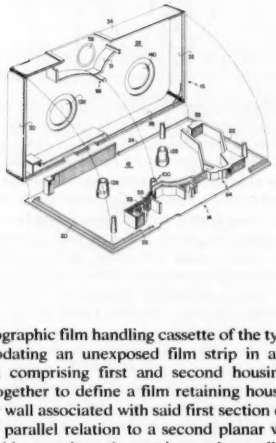
wherein A is the power addition, in dioptres, between the distant-vision center and the close-vision center.

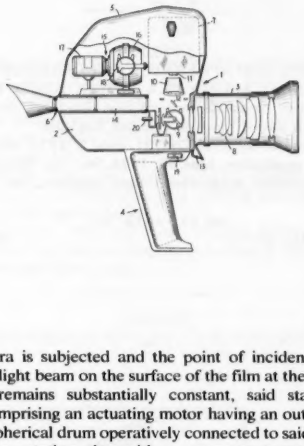
3,910,692

FILM HANDLING CASSETTE ASSEMBLY

Peter A. Scibilia, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 2, 1974, Ser. No. 429,726
Int. Cl.² G03C *11/00*
U.S. Cl. 352—130 **12 Claims**





1. A photographic film handling cassette of the type capable of accommodating an unexposed film strip in a light-tight environment comprising first and second housing sections assembled together to define a film retaining housing having a first planar wall associated with said first section disposed in substantially parallel relation to a second planar wall associated with said second section and an edge wall extending between and serving to space said first and second planar walls at least around a portion of the periphery thereof, said housing sections being permanently joined to each other at at least a portion of said edge wall so as to provide a light-tight interior prior to the exposure of the film strip, at least one of said planar walls being a thinwalled deflectable construction, and means spaced apart from said edge wall for releasably securing said housing sections to each other said means including an elongated member extending from one of said planar walls and an opposed receiving member from the other of said planar walls wherein said elongated member is configured for frictional engagement by the opposed receiving member to provide a releasable holding force which operates to slightly deflect the thinwalled planar wall toward the other planar wall at a location spaced apart from the periphery thereof in this manner locating and peripherally biasing said housing sections into substantially parallel light-tight relation at least prior to said permanent joining.

3,910,693

GYROSCOPIC IMAGE MOTION COMPENSATOR FOR A MOTION PICTURE CAMERA

Juan J. De La Cierva, Apolonio Morales 21, Madrid 6, Spain

Filed Jan. 24, 1974, Ser. No. 436,354
Claims priority, application Spain, Jan. 25, 1973, 410960
Int. Cl.² G03B *19/00;* **G02B** *23/00*
U.S. Cl. 352—244 **6 Claims**

1. In a motion picture camera having a variable focal length lens system including a focal converter and a film exposure window formed therein behind which film to be exposed passes; an image-movement compensation device for improving the definition of images recorded by the camera when the camera is subjected to vibrations; said device comprising a reflecting element mounted in said camera to reflect a collimated light beam from said focal converter to the film passing said exposure window; means for mounting said reflecting element in the camera for pivotal movement at the point of incidence of said light beam therewith in the elevation and azimuth planes of said camera; magnetically damped gyroscopic stabilization means for controlling the spatial position of said reflecting element in the camera, and transmission means operatively connected between said stabilization means and said reflecting element for pivoting said reflecting element in response to relative displacement of the stabilization means, whereby the light beam reflected from the reflecting element to the film is substantially unaffected by vibrations to which the camera is subjected and the point of incidence of the reflected light beam on the surface of the film at the exposure window remains substantially constant, said stabilization means comprising an actuating motor having an output shaft, a partly spherical drum operatively connected to said shaft for concentric rotation therewith, a permanent magnet ring shaped gyroscope; means for mounting said gyroscope within said drum for pivotal movement in the elevation and azimuth planes; and means operatively connecting said output shaft to said gyroscope for rotating said gyroscope while allowing movement of the gyroscope in the elevation and azimuth planes independently of said shaft, whereby said gyroscope is magnetically linked to said drum and damped by the effects of eddy currents resulting from its interaction with the drum to thereby maintain a relatively fixed position in the camera when the camera suffers a brusque movement of low amplitude and high frequency.

3,910,694

SLIDE PROJECTION AND SOUND REPRODUCTION SYSTEM

Siegfried Schutze, Dresden, Germany, assignor to VEB Pentacon Dresden, Dresden, Germany

Continuation of Ser. No. 262,924, June 9, 1972, abandoned. This application Apr. 11, 1974, Ser. No. 460,260
Int. Cl.² G03B *31/06*
U.S. Cl. 353—15 **7 Claims**

1. The combination of a slide projector and a sound reproduction system, said slide projector having movable storage means for storing a sequence of slides, means for projecting said slides in a forward or reverse sequence and transport means for effecting respectively forward and reverse movement of said storage means, and said sound reproduction system incorporating magnetic tape and a pilot head adapted

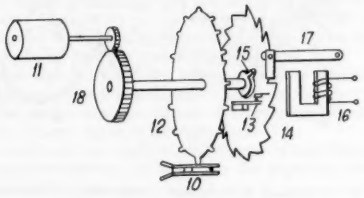
to emit control pulses at a variable frequency for slide changing purposes the provision of:

a. first switch means for effecting operation of the transport means,

b. drive means for periodically controlling said first switch means to effect operation of said transport means when the drive means is energized,

c. a second switch for normally energizing said drive means,

d. positionable means normally located at a position to render said second switch inoperative to energize the drive means,



e. movable means supporting said second switch,

f. control means responsive to said control pulses for moving the second switch supporting means to move the second switch away from said position a predetermined distance for each received pulse to energize said drive means while it is removed from said position,

g. and means operated by the drive means for returning the positionable means to said position to render the second switch inoperative to energize the drive means.

3,910,695

AUTOMATIC FOCUS ADJUSTING DEVICE FOR USE IN INFORMATION RETRIEVING APPARATUS

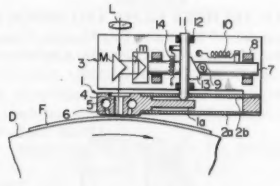
Shigetomi Fukuhara, Chiba, and Takakiyo Ito, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 26, 1974, Ser. No. 445,917

Claims priority, application Japan, Feb. 28, 1973, 48-23181

Int. Cl.[2] G03B *3/06, 23/10*

U.S. Cl. 353—101 **10 Claims**



1. An automatic focus adjusting device for use in an information retrieving apparatus comprising a projection lens for retrieving information stored in an information storing means, a first stationary reflecting means disposed between said information storing means and said projection lens for reflecting information bearing light from said information storing means in a direction perpendicular to the longitudinal axis of said lens, a movable reflecting means for reflecting said reflected information bearing light in a parallel but opposite direction, a second stationary reflecting means for further reflecting said reflected information bearing light in a direction perpendicular to the direction of reflection by said movable reflecting means, said first and second stationary reflecting means and said movable reflecting means being disposed in such a relation that the light passing along the optical axis of the optical system can be focussed on the information bearing surface of said information storing means, and means responsive to the movement of said information storing means toward or away from said lens in a direction parallel to the longitudinal axis of said lens to cause movement of said movable reflecting means away from or toward said first and second reflecting means in a direction perpendicular to the longitudinal axis of said lens by an amount which is one-half of the amount of movement of said information storing means relative to said lens, wherein said responsive means comprises a slider disposed in close proximity to said information storing means and provided with a fluid discharge opening opposite to said information storing means, said slider being urged away from or toward the information bearing surface of said information storing means by the pressure of fluid discharged from said fluid discharge opening so that said movable reflecting means can follow the movement of said slider and the focus of said lens can be positioned always on the information bearing surface of said information storing means.

3,910,696

SLIDE CHANGING EQUIPMENT FOR MAGAZINE SLIDE PROJECTORS

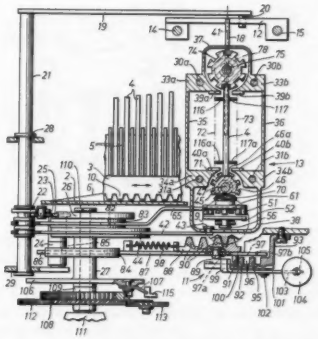
Hans Mulch, Wetzlar, Germany, assignor to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed Jan. 24, 1975, Ser. No. 543,807

Claims priority, application Germany, Jan. 29, 1974, 2404028

Int. Cl.[2] G03B *23/04*

U.S. Cl. 353—116 **16 Claims**



1. In a slide changing apparatus for magazine slide projector having slide pushrods driven by control means, one of said pushrods service to insert the slides into an image aperture and the other to move back those slides that have been projected into the magazine, the improvement comprising:

a transport path and a projecting stage located in a common plane and the insertion pushrod serving to insert slides along said path, a slide return path located alternatively on either side of said common plane, transporter means actuated by driving means to transport a slide that has been projected from said projecting stage to said return path, and also to transport said magazine in the same direction, said other pushrod acting to move a slide that has been transported to said return path along said return path back to said magazine, said transporter means being operable alternatively to move a slide to either side of said common plane to give either a forward or reverse operation, and control means being operative so that the pushrods and the driving means operate to move a slide from the magazine to the projection stage, then to the return path, and then back to the magazine.

3,910,697

PROCESS AND APPARATUS FOR REGENERATING A PHOTOCONDUCTIVE LAYER

Willi Lanker, Zumikon, Switzerland, assignor to Turlabor A.G., Zumikon, Switzerland

Division of Ser. No. 168,224, Aug. 2, 1971, Pat. No. 3,815,295.
This application Apr. 29, 1974, Ser. No. 465,248
Int. Cl.[2] G03G *13/00*
U.S. Cl. 355—17 6 Claims

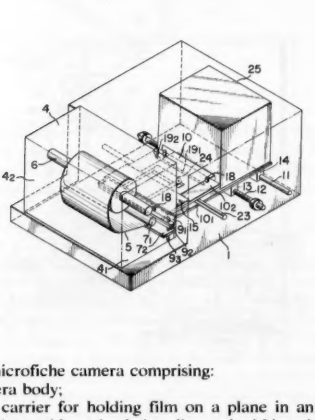
6. An electrophotographic duplicating process comprising forming a latent electrostatic image on a photoconductive layer having a substantial amount of an organic material, transferring the latent electrostatic image on said layer to a receiving material and periodically regenerating said photoconductive layer for reuse by removing surface particles of said photoconductive layer from the remainder of said layer before forming a latent electrostatic image.

3,910,698

PHOTOGRAPHIC APPARATUS

Yoshiaki Sone, and Kazuo Kashiwagi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 7, 1973, Ser. No. 367,841
Claims priority, application Japan, June 17, 1972, 47-71001
Int. Cl.[2] G03B *27/62, 27/32*
U.S. Cl. 355—54 17 Claims



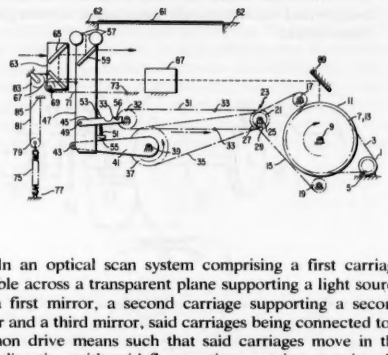
1. A microfiche camera comprising:
a camera body;
a film carrier for holding film on a plane in an exposed position, said carrier being disposed within said camera body;
means associated with said carrier for laterally shifting the carrier and the film
a film supply magazine detachably mounted in a stationary position on said camera body and accommodating unexposed film in rolled form, said supply magazine having a film feed opening of a width approximately two times the width of the film and a shaft which provides for free lateral movement, relative to the shaft, of the film wound around it, with said magazine being stationary, when said film carrier moves laterally together with the film;
means for taking up the film which has passed through the film carrier from said supplying magazine; and
a pair of opposed rollers mounted on said carrier for feeding the film;
whereby images are recordable on the film in predetermined intervals in the direction of the width of the film by sequential intermittent shifting of the carrier, and in predetermined intervals in the longitudinal direction of the film by sequential intermittent driving of the rollers.

3,910,699

SCAN CYCLING MECHANISM FOR COPIERS

Robert A. Middleton, 1544 Queens Place, Philadelphia, Pa. 19122

Filed Oct. 25, 1974, Ser. No. 518,106
Int. Cl.[2] G03G *15/28;* G03B *27/50*
U.S. Cl. 355—66 4 Claims



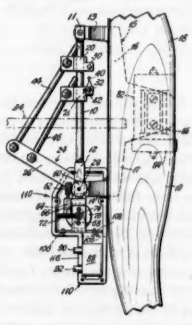
1. In an optical scan system comprising a first carriage movable across a transparent plane supporting a light source and a first mirror, a second carriage supporting a second mirror and a third mirror, said carriages being connected to a common drive means such that said carriages move in the same direction with said first carriage moving at twice the velocity of said second carriage, a lens focused on a photoresponsive surface, said mirrors being positioned on said carriages such that images from said transparent plane are directed from said first mirror to said second mirror to said third mirror to said lens, the improvement wherein said drive means comprises a cable carrying at least one extending pin and mounted for endless movement around two, spaced pulleys to form a straight reach, and an arm pivotally connected to said first carriage and spring biased toward the incoming direction of said pin when it moves over one of said pulleys, said arm having a recess adapted to become engaged when said pin enters said recess as said pin begins to move in the direction of said reach, the cable then carrying said first carriage the length of the reach and until said pin moves out of said recess as it moves over the other of said pulleys.

3,910,700

MOTORIZED ARCHERY SIGHT AND RANGE FINDER

Harold R. Sprandel, 19 Brookside Dr., Monroe, Conn. 06468

Filed Jan. 25, 1974, Ser. No. 436,757
Int. Cl.[2] F41G *1/00*
U.S. Cl. 356—21 9 Claims



1. An archery sight and range finder comprising, in combination:
a. an elongate slide,

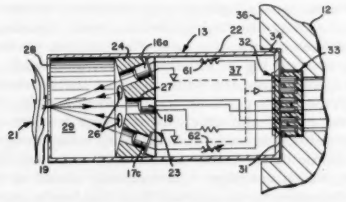
b. means for mounting the slide vertically on a central portion of an archer's bow,
c. a pair of sliders carried by and vertically movable on the slide,
d. a drive member pivotally carried by the slide and having an actuating arm,
e. a pair of links pivotally connected to said actuating arm at spaced-apart points thereon,
f. said links being respectively pivotally connected to the sliders whereby movement of the arm shifts the sliders at different rates along the slide to vary the spacing between them and simultaneously reposition them vertically,
g. a pair of projecting sight bars disposed alongside each other respectively on said sliders and arranged to be located at the path of vision of an archer who is sighting game with the bow in shooting position,
h. said sight bars thereby having a variable spacing and variable vertical positioning by virtue of their being carried by the respective sliders, whereby game can be visually located between the sight bars,
i. a bull's-eye type sight carried by one of said sliders and disposed between the sight bars, for alignment with the game being sighted,
j. a gear train comprising a worm gear rigidly connected to the drive member to operate the latter at a reduced speed, comprising a worm engaged with the worm gear, a second worm gear rigid with said worm, and a second worm engaged with the second worm gear,
k. an electric motor having its shaft rigid with the second worm of the gear train to drive the same,
l. an electric battery,
m. a reversing switch having forward, reverse, and open positions,
n. circuit means connecting the battery to the motor through said reversing switch,
o. a housing below and carried by said slide, in which the drive member, gear train, electric motor and reversing switch are all mounted, said housing including a depending portion of smaller girth in which the reversing switch is disposed, and
p. a pair of spring-biased push buttons connected to the reversing switch and protruding from a wall of the depending portion of the housing in a location enabling them to be easily and quickly actuated for effecting adjustment of the sliders.

3,910,701

METHOD AND APPARATUS FOR MEASURING LIGHT REFLECTANCE ABSORPTION AND OR TRANSMISSION

George R. Henderson, 6217 Picardie Road, Miraleste, Calif. 90732, and David A. Grafton, 427 Palisades Ave., Santa Monica, Calif. 90402

Filed July 30, 1973, Ser. No. 384,026
Int. Cl.[2] G01N *33/16*
U.S. Cl. 356—39 **11 Claims**



10. A method of measuring light reflectance, transmission and/or absorption at different wavelengths, the steps comprising:

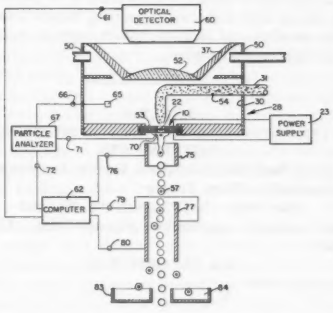
selectivity and alternately energizing a plurality of light emitting diodes having light emissions of different wavelength;
reflecting said light emissions from said diodes with respect to a test object and receiving said reflected light emissions at a light sensor to produce an alternating current electrical output signal having an amplitude representing the difference in reflectivity of the test object as a function of the different wavelengths to produce a differential light reflectance signal;
receiving the electrical signal produced by said sensor means in response to the diode light emissions reflected by the test object; and
rectifying the alternating current signal to produce a direct current signal to be displayed as a measure of said differential light reflectance signal.

3,910,702

APPARATUS FOR DETECTING PARTICLES EMPLOYING APERTURED LIGHT EMITTING DEVICE

James A. Corll, Los Alamos, N. Mex., assignor to Particle Technology, Inc., Los Alamos, N. Mex.

Filed Feb. 12, 1974, Ser. No. 441,754
Int. Cl.[2] G01N *21/00, 15/02*
U.S. Cl. 356—72 **41 Claims**



1. An apparatus for detecting particles suspended in a fluid medium including in combination:
a light emitting device for developing a plane of light, said light emitting device having a bore therethrough, said plane of light extending interior to said bore and transverse to the axis of said bore,
means for coupling the particles suspended in the fluid medium to said bore, and
detection means for detecting a first signal developed in response to said particles passing through said bore and through said plane of light.

3,910,703

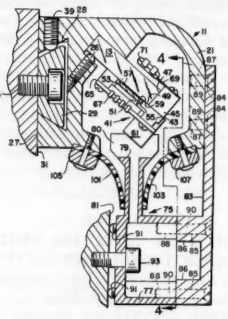
MEASURING APPARATUS USING THE MOIRE FRINGE CONCEPT OF MEASUREMENT

Richard H. Burns, Webster; Donald R. Hosack, and Helmut Welker, both of Jamestown, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Division of Ser. No. 295,777, Oct. 6, 1972, Pat. No. 3,833,303. This application May 28, 1974, Ser. No. 473,461
Int. Cl.[2] G01B *11/02*
U.S. Cl. 356—169 **10 Claims**

1. In apparatus, securable to first and second relatively movable members for use in measuring the relative displacement therebetween, including a scale, means for supporting said scale, a transducer means including a carriage and an index grating, said carriage including scale engaging means, transducer support means, and means secured between said transducer means and said carriage for urging said scale en-

gaging means into engagement with said scale, wherein the improvement comprises: means for rigidly coupling said transducer support means to said scale supporting means to posi-

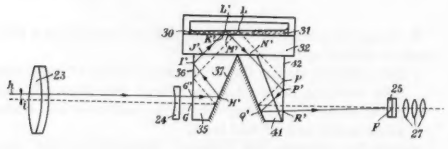


tion said transducer support means relative to said scale supporting means until said scale supporting means is secured to said first member and said transducer support means is secured to said second member.

3,910,704
COMPENSATING DEVICE FOR SIGHTING INSTRUMENTS

Victor Louis Paul Richarme, Paris, France, assignor to Essilor International, Le Pont, France

Filed Mar. 12, 1974, Ser. No. 450,482
Claims priority, application France, Mar. 13, 1973, 73.08943
Int. Cl.[2] G01C *9/18*
U.S. Cl. 356—249 **7 Claims**

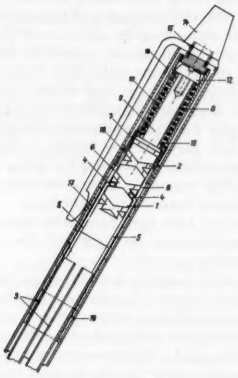


1. An optical sighting instrument comprising a sighting-piece including a teleobjective, a reticle and an eyepiece, and a device for compensating the non-horizontality of the instrument, said compensating device comprising a liquid sheet having a surface remaining constantly horizontal, and a reflecting system associated with said sheet and adapted to impart to an incident light beam, between the point of penetration thereof into the reflecting system and said liquid sheet, an even number of reflections, whereby said light beam, after passing a first time through said liquid sheet, is caused to pass again therethrough subsequent to a total reflection at a point of said permanently horizontal surface of said liquid sheet, and said compensating device being so disposed between said teleobjective and said reticle, that the length *l* of the optical path from the center of said reticle to the point of total reflection of the light beam on the permanently horizontal surface of said liquid sheet is equal, for infinity focusing, to *f*/*x*, *f* designating the focal length of the telobjective and *x* a constant depending on the refractive indices of said liquid and of said material constituting said reflecting system, and also on the geometrical arrangement of said compensating device.

3,910,705
MULTICOLOR WRITING INSTRUMENT

Emil Schumacher, Birkenfeld, Germany, assignor to Firma Sarastro Kinzinger GmbH, Pforzheim, Germany

Filed July 25, 1974, Ser. No. 491,660
Int. Cl.[2] B43K *27/12*
U.S. Cl. 401—30 **12 Claims**



1. In a color-changing multicolor writing instrument of the type containing a rotatable, cylindrical cam groove member with oppositely threaded crossing helical cam grooves disposed on the periphery thereof and a plurality of refill carriers having end portions which engage said cam grooves;

the improvement consisting of providing a guide sleeve with two axially extending longitudinal slots, each of said slots defining a channel in which said end portions ride, the ends of each of said channels defining the limits of axial movement of each of said end portions, said improvement further consisting of said cam groove member being disposed for limited axial movement, a return spring biased against the axial movement of the cam groove members so that when one of said end portions is engaged by the ends of one of said slots, said cam groove member is advanced axially against said bias.

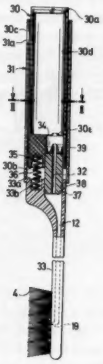
3,910,706
CARTRIDGE FOR LIQUID OR PASTY DENTIFRICE

Franco Del Bon, Zofingen, Switzerland, assignor to Trisa Burstenfabrik AG

Filed Mar. 21, 1974, Ser. No. 453,403
Claims priority, application Switzerland, June 6, 1974, 003401/74; Germany, Jan. 7, 1974, 2400514
Int. Cl.[2] A46B *11/00*
U.S. Cl. 401—134 **6 Claims**

1. A cartridge for liquid or pasty dentifrice, combined with a fountain toothbrush having a bristle carrier, a guiding sleeve member connected to the latter for receiving the cartridge therein and serving as a handle of the toothbrush, a duct means leading from the bottom part of the sleeve member through the bristle carrier to a set of bristles on the latter, an actuating means with which the cartridge is adapted to be brought into engagement, said actuating means comprising a piston borne by the bristle carrier at its end away from the bristles, which cartridge is hermetically closed at the end thereof destined for facing away from said bristle carrier, and has a reservoir for dentifrice in its interior and an outlet passage of said reservoir opening in the frontal face of said cartridge being destined to face said bristle carrier, said outlet passage being adapted for receiving therein said piston in displaceable, sealing engagement, said cartridge comprising a

sealing membrane hermetically closing off said outlet passage prior to introduction of said cartridge into said sleeve member, said membrane being ruptured by piercing means associated with said piston, at the time of the aforesaid introduction, and abutment means provided in the wall of said cartridge comprising a recess in the frontal face of said cartridge and adapted for receiving therein a resetting spring.



3,910,707

AIR PRESSURE COMPENSATION ARRANGEMENT FOR A CARTRIDGE AND WRITING OR DRAWING INSTRUMENT

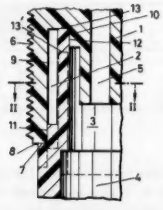
Claus Gottschalk, Nurnberg, Germany, assignor to Firma J.S. Staedtler, Nurnberg, Germany

Filed July 18, 1974, Ser. No. 489,627

Claims priority, application Germany, Aug. 3, 1973, 7328357[U]

Int. Cl.[2] B43K *5/14*

U.S. Cl. 401—135 **10 Claims**



1. An arrangement for connecting a cartridge containing a writing liquid with a writing head wherein the cartride has a neck insertable within an annular slot in the writing head, the combination wherein said annular slot and said cartridge neck have inner and outer annular surfaces, at least a portion of said inner annular surface of said writing head being adapted to sealingly mate with a corresponding portion of the inner annular surface of said cartridge neck, at least a portion of said outer annular surface of said writing head being adapted to sealingly mate with a corresponding portion of the outer annular surface of said cartridge neck, said sealing mating being effected as said cartridge neck is being inserted within said annular slot in said writing head, longitudinally extending passageway means in at least two of said annular surfaces providing for egress of air from said annular slot as the cartridge neck is being inserted in said annular slot in said writing head, said passageway means having axial lengths shorter than the respective axial lengths of the inner and outer annular surfaces so that complete circumferential sealing is effected between said mating annular surfaces just before the cartridge neck reaches its seated position on the writing head.

3,910,708

SECURING DEVICE FOR LOOSE-LEAF BINDERS

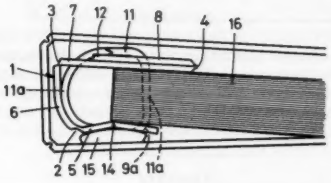
Benedikt Rohner, Zurich, Switzerland, assignor to Robert Krause KG, Espelkamp, Germany

Filed Dec. 13, 1974, Ser. No. 532,467

Claims priority, application Switzerland, Dec. 13, 1973, 17464/73

Int. Cl.[2] B42F *3/04*

U.S. Cl. 402—80 R **1 Claim**



1. A securing device for a loose-leaf binder having rings each formed of two ring-halves, said device comprising a strip of material having three fold-lines disposed at right angles to the longitudinal axis of said strip, two elongated slots, two resilient lobes at one end of said strip, and a hole disposed at the base of said lobes, wherein said fold-lines are so disposed that said strip can be folded into four sections by bending it at a 90° angle in one direction about the first two of said fold-lines and folding it back by 180° in the opposite direction along the third of said fold-lines so that the first, third and fourth of said sections thus formed then lie in substantially parallel planes, said slots are then situated in said first and third sections, lie upon one another, and are adapted to cooperate with a said ring, the slot in said first section extends into said second section, the width of said slots being greater than the thickness of said ring, said slot in said first and second sections being longer and said slot in said third section being shorter than the diameter of said ring, the free end of said fourth section is adapted to form a fastening head comprising said lobes, said lobes being adapted for positioning under the uppermost portion of said ring, and said hole is adapted to receive one of said ring-halves, the length of said third section being such that it forms a holding-down tongue together with said fourth section.

3,910,709

JOINT ASSEMBLY FOR DISCONNECTING A SEGMENTED CUTTER BAR

Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Company, Cincinnati, Ohio

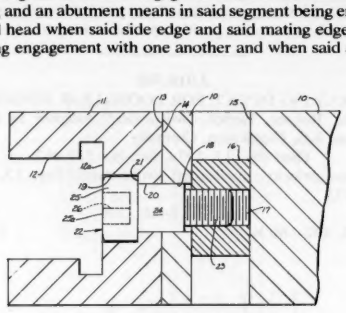
Filed Feb. 1, 1974, Ser. No. 438,634

Int. Cl.[2] F16D *1/10*

U.S. Cl. 403—8 **10 Claims**

1. An improved segmented cutter bar combination for mining machines and the like comprising: a cutter bar having a top surface and a bottom surface and an external peripheral side edge between said two surfaces; a threaded attachment means located within a bore provided in said cutter bar inwardly from said side edge and extending from one of said surfaces towards the other of said surfaces, said bore being of a size closely receiving and maintaining said attachment means; a cutter chain holding segment having a mating edge held against said side edge; a separate threaded attachment member rotatably located in a smooth bore provided in said segment and having a head thereon, said attachment member

being received by a smooth orifice provided in said side edge and being in threaded engagement with said attachment means; and an abutment means in said segment being engaged by said head when said side edge and said mating edge are in abutting engagement with one another and when said attachment means and said attachment member are in threaded engagement with one another; whereby said segment may be disconnected from said cutter bar by applying pressure through said first mentioned bore against said attachment means to break said attachment member.

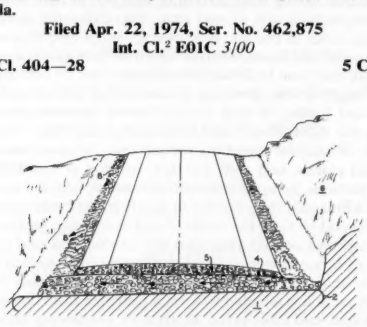


3,910,710

FREE-DRAINING GRANULAR BASE FOR PREPARED GROUND SURFACE

Duane W. Gagle, and Homer L. Draper, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 22, 1974, Ser. No. 462,875
Int. Cl.² E01C *3/00*
U.S. Cl. 404—28 **5 Claims**



1. A traffic-bearing construction structure having improved drainage and stability comprising a traffic-bearing surface and a subsoil underlying said surface, said surface and said subsoil having positioned therebetween a free-draining layer of aggregate capable of receiving some surface water, said layer of aggregate and said subsoil having therebetween a water-impervious barrier positioned such that water in the subsoil cannot pass upward into the aggregate and such that water in the aggregate drains away from both edges of the traffic-bearing surface toward some low point under said surface and passes through a drainage means which discharges the water to some point away from the subsoil underlying the aggregate.

3,910,711

CONCRETE FORMING APPARATUS

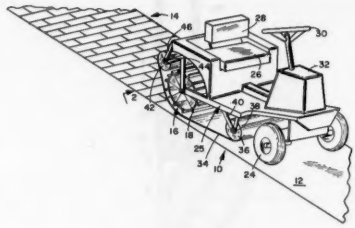
William V. Moorhead, 33052 Marina Vista Drive, Dana Point, Calif. 92629

Continuation-in-part of Ser. No. 279,709, Aug. 10, 1972, Pat. No. 3,832,079. This application Aug. 9, 1974, Ser. No. 496,255
Int. Cl.² E01C *23/02*
U.S. Cl. 404—89 **8 Claims**

1. Apparatus for continuously impressing a pattern in concrete comprising:

a substantially non-deformable cylindrical member adapted for rotation about its longitudinal axis;

said member having blades projecting from its cylindrical surface in a form corresponding to a pattern to be impressed in the concrete simulating a plurality of masonry elements;



a frame supporting said cylindrical member and including a bearing in which said cylindrical member is journaled for rotation about its longitudinal axis; and,

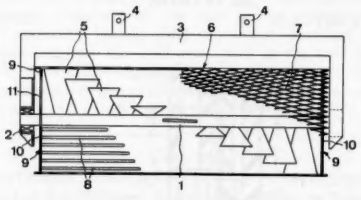
wheels connected to said frame for movably supporting said frame outside of the margins of said cylindrical member so that said cylindrical member can be rotatively moved over concrete while said wheels support said cylindrical member extrinsic to the margins of said roller.

3,910,712

HOLLOW ROLLER HAVING AN APERTURED SURFACE FOR TREATING THE GROUND

Adolphe M. Crete Guerin, 98 rue Nationale, Mezieres sur Seine (Yvelines), France

Filed Nov. 14, 1974, Ser. No. 523,671
Claims priority, application France, Nov. 22, 1973, 73.41922
Int. Cl.² E01C *19/26*
U.S. Cl. 404—124 **3 Claims**



1. A roller having an apertured surface for treating grounds, comprising a roller shaft to which is secured an endless screw which has at least one thread and may be continuous or discontinuous and is coaxial with the roller and has a height exceeding two-thirds of the radius of the roller, the apertured surface being secured to said screw.

3,910,713

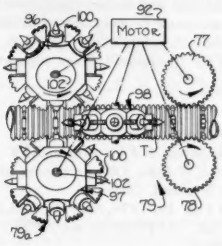
METHOD FOR MAKING CORRUGATED PLASTIC TUBING

Ernest J. Maroschak, Box 878, Roseboro, N.C. 28382

Continuation-in-part of Ser. Nos. 262,192, June 13, 1972, Pat. No. 3,819,778, and Ser. No. 278,003, Aug. 4, 1972, abandoned. This application Sept. 1, 1972, Ser. No. 285,920
Int. Cl.² B29C *17/10*
U.S. Cl. 408—1 **6 Claims**

1. A method for cooling a longitudinally advancing hot annularly corrugated plastic tube following the molding thereof and for forming a plurality of spaced apertures along the length thereof such that the resulting tube is suitable for

use as drainage tubing or the like, and comprising the steps of passing the advancing tube through a cooling chamber comprising first and second successively arranged zones while directing a plurality of streams of liquid coolant surroundingly arranged about the path of travel of the tube over the hot corrugated exterior surfaces of the portion of the tube disposed within the first zone, and while wiping the adhering residual coolant from the corrugated exterior surface of the portion of the tube disposed within said second zone by directing a high velocity current of gas upon the exterior of the tube whereby the tube is delivered from the second zone in a substantially dry condition, and



drilling at least one longitudinal row of spaced apertures along the length of the thus cooled advancing tube by rotating a plurality of drill bits which are positioned in an equally spaced radial arrangement extending outwardly from a central axis, and orbiting the drill bits about the central axis such that the working ends of the drill bits have a component of longitudinal movement corresponding to the speed of movement of the tube and each successive drill bit moves into and out of the advancing tube to form apertures at predetermined points along the tube.

3,910,714

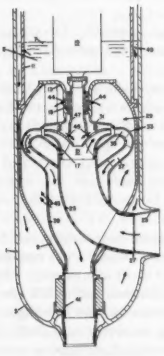
LIQUID METAL PUMP FOR NUCLEAR REACTORS

Harvey G. Allen, Murrysville, and James R. Maloney, Irwin, both of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 11, 1974, Ser. No. 531,589

Int. Cl.[2] F04D *1/00, 7/02*

U.S. Cl. 415—53 R **3 Claims**



1. A pump for use in pumping high temperature liquid under high pressures comprising a tank closed at its bottom to form a sump, a substantially closed chamber within said tank and spaced therefrom, a substantially closed casing within said chamber and spaced from it over most of its area, but merging with the upper portion of said chamber to form a bearing housing and merging with the lower portion of said chamber to form an outlet duct, a centrifugal pump rotor suspended within and discharging into said casing and having a bearing within said bearing housing, an inlet duct passing through the walls of said tank, said chamber, and said casing and communicating with said pump rotor, passageways through the wall of said casing and through said bearing housing, said bearing communicating with said sump, whereby a portion of the liquid discharged from said pump will flow into the space between said casing and said chamber, then into said bearing, and finally into said sump, thereby equalizing pressures inside and outside said casing and reducing thermal shock to said chamber, bearing and tank on changes in temperatures in said inlet duct.

3,910,715

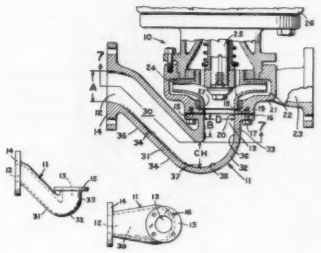
SIDE INLET MEANS FOR CENTRIFUGAL PUMPS

Shmariahu Yedidiah, West Orange, N.J., assignor to Worthington Pump International, Inc., Mountainside, N.J.

Filed June 27, 1973, Ser. No. 374,088

Int. Cl. F04d *29/42, 29/44*

U.S. Cl. 415—182 **6 Claims**



1. A side inlet means for centrifugal pumps comprising:

a. first means forming an inlet at one end of the side inlet means,

b. second means forming an outlet at the other end of the side inlet means and said outlet having a given cross-sectional flow area,

c. means forming a fluid flow passage through said side inlet means including,

1. a descending seciton forming the portion of said fluid flow passage in communication with the inlet, said descending section expanding to provide at the end of said portion of the fluid flow passage remote from the inlet remote from the inlet end a substantially elliptical cross-sectional flow area having a major axis and a minor axis and the flow area therethrough being greater than but not more than three times the cross-sectional flow area of the outlet,

2. a curved section sized at one end to fit the expanded end of the descending section, the major axis of the substantially elliptical cross-sectional flow area being parallel to the axis of curvature of said curved section and the minor axis transverse thereto,

3. said curved section to form the intermediate portion of said fluid flow passage and contracting at the end remote from the end thereof connected to the descending section to provide at said remote end of the intermediate portion of the fluid flow passage a cross-sectional flow area substantially equal to the cross-sectional flow area of the outlet whereby the velocity of the fluid flow through the descending section is reduced before it enters the curved section and the velocity of the fluid is accelerated after it leaves the curved section, and

4. a straight cylindrical section between the contracted end of the curved section and the outlet forming the portion of the fluid flow passage connecting the intermediate portion with the outlet, and

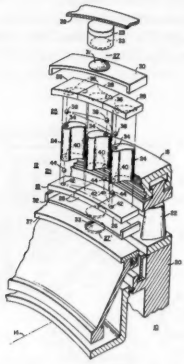
d. means for connecting the side inlet means into assembled position for use.

3,910,716

GAS TURBINE INLET VANE STRUCTURE UTILIZING A STABLE CERAMIC SPHERICAL INTERFACE ARRANGEMENT

Jeffrey D. Roughgarden, Palo Alto, Calif., and Stephen D. Leshnoff, Highland Park, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 23, 1974, Ser. No. 472,753
Int. Cl.² F01D 9/02
U.S. Cl. 415—217 **1 Claim**



1. An inlet nozzle for a gas turbine having a radially inner shroud ring, a radially outer shroud ring coaxial with said inner shroud ring, and an annular array of vane segments compressively retained therebetween, each of said vane segments comprising:

a. three radially extending ceramic blades;

b. three separate outer supportive end caps forming an outer arcuate segment;

c. three separate inner supportive end caps forming an inner arcuate segment;

d. a first support means extending across said outer arcuate segment for retaining said outer end caps in proper orientation, with each end cap in opposed facing relationship to the radially outer end of a blade;

e. a second support means extending across said inner arcuate segment for retaining said inner end caps in proper orientation, with each end cap in opposed facing relationship to the radially inner end of a blade;

f. means providing a ball and socket engagement between said first support means and said outer shroud ring generally midway between the arcuate extent of said support means;

g. means providing a ball and socket engagement between said second support means and said inner shroud ring generally midway between the arcuate extent of said second support means;

h. means providing a ball and socket engagement between each end cap and the adjacent radial end of the blade associated therewith;

i. said ball and socket engagements between each of the three blades and their respective outer end caps being disposed such that each point of engagement determines a vertex of a first included triangle;

j. said ball and socket engagements between each of the three blades and their respective inner end caps being disposed such that each point of engagement determines the vertex of a second included triangle; and wherein,

k. said vertices of said first included triangle in conjunction with said ball and socket engagement of said outer shroud to said support means define a substantially stable tetrahedral relationship between the points of engagement for the radially outer support of each vane segment; and,

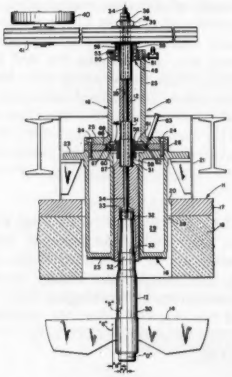
l. said vertices of said second included triangle in conjunction with said ball and socket engagement of said inner shroud to said inner support means define substantially stable tetrahedral relationship between the points of engagement for the radially inner support of each vane segment.

3,910,717

FURNACE FAN ASSEMBLY

William L. Thome, Toledo, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Feb. 19, 1974, Ser. No. 443,340
Int. Cl.² F04D 29/40, 29/20
U.S. Cl. 415—219 C **2 Claims**



1. A furnace fan assembly for circulating a hot gaseous medium in a furnace, said assembly comprising:

a shaft;

a fan wheel on said shaft adjacent one end thereof and in contact with said hot gaseous medium;

motor means for rotating said shaft and fan wheel from rest to a predetermined speed above critical; and

means for supporting said shaft and said fan wheel and permitting said shaft and fan wheel to pass through a critical speed between 200–400 rpm, said means including

first bearing means including a self-aligning type bearing adjacent the end of said shaft opposite said fan wheel for journaling said shaft in a manner which permits said shaft to rotate in a conical path with the apex of said conical path at the center of said bearing,

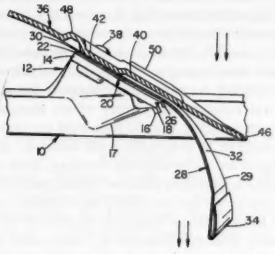
a second bearing receiving said shaft and positioned on said shaft between said first bearing and said fan wheel, and

resilient means supporting said second bearing for permitting orbital movement of said second bearing relative the axis of said first bearing while said shaft rotates within said second bearing, said resilient means also dampening vibration of said shaft and said fan wheel while same orbit about said first bearing.

3,910,718
LIMITED DEFLECTION FLEXIBLE BLADED FAN FOR USE WITH VISCOUS SHEAR CLUTCH

Ralph Miller MacEwen, and Richard Paul Beldam, both of Chatham, Canada, assignors to Fram Corporation, East Providence, R.I.

Filed Mar. 18, 1974, Ser. No. 452,074
Int. Cl.[2] F04D *29/38*
U.S. Cl. 416—132 **15 Claims**



1. In an automotive cooling fan, rotatable in a plane, for use with a viscous shear clutch, said fan having a hub and a plurality of fan blade assemblies each comprising an arm extending radially outwardly from said hub and a flexible resilient blade having a leading portion, defined by the direction of fan rotation, extending radially along said arm and connected to said arm radially therealong, said blade having radially spaced inner and outer side edges and extending transversely to a trailing portion thereof terminating in a trailing edge spaced rearwardly of said arm and said blade curved from said arm to a position at said trailing edge downstream of said arm, relative to the direction of airflow from said fan, said blade presenting a transversely extending convex surface on the upstream side thereof, said trailing portion and said trailing edge decambering to a relatively more upstream position as rotational speed increases, and a rigid reinforcement member radially connected to and against the upstream side of said blade leading portion, said reinforcement member extending radially along said leading portion and transversely therefrom toward said blade trailing portion overlying said convex surface, said reinforcement member spaced a progressively greater distance from said blade convex surface toward the trailing portion of said blade, the improvement in which:

said reinforcement member extends transversely, at an acute angle to said plane, to a trailing position along a line extending generally radially along said blade and said reinforcement member at radially spaced positions along said line respectively adjacent said inner and outer side edges, said line spaced transversely from the connection of said reinforcement member to said blade a distance greater than 50% of the transverse extent of said blade to said blade trailing edge from said connection, whereby said reinforcement member restrains decambering of said blade beyond said acute angle.

3,910,719
COMPRESSOR WHEEL ASSEMBLY

Barton H. Hessler, Shelton, and Victor Strautman, Trumbull, both of Conn., assignors to Avco Corporation, Stratford, Conn.

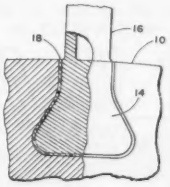
Filed Nov. 2, 1973, Ser. No. 412,391
Int. Cl.[2] F01D *5/30*
U.S. Cl. 416—134 **1 Claim**

1. In a compressor for use in a gas turbine engine, the combination comprising:

a metallic rotor disc having a plurality of slots in the outer periphery thereof;

metallic compressor blades each having an airfoil section attached to a blade root, said roots being loosely positioned within said slots; and

a thermosetting adhesive capable of withstanding the compressive stresses to which it is subjected during the operation of said gas turbine engine, filling the gap between said roots and the walls of said slots, said thermosetting adhesive comprising a resin filled with a mixture of aluminum, alumi-

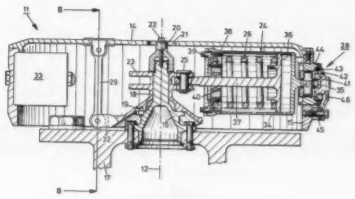


num oxide and iron oxide, the ratio of said resin to said mixture being approximately 1:1 and the proportions of aluminum, aluminum oxide and iron oxide in said mixture being in the ranges of 10–35% Al, 20–80% Al_2O_3 and 10–25% Fe_3O 4.

3,910,720
VIBRATION ABSORBING MEANS

Alan Henry Vincent, and Peter John Flux, both of Yeovil, England, assignors to Westland Aircraft Limited, Yeovil, England

Filed Apr. 8, 1974, Ser. No. 459,078
Claims priority, application United Kingdom, Apr. 26, 1973, 19997/73
Int. Cl.[2] B64C *27/32*
U.S. Cl. 416—145 **15 Claims**

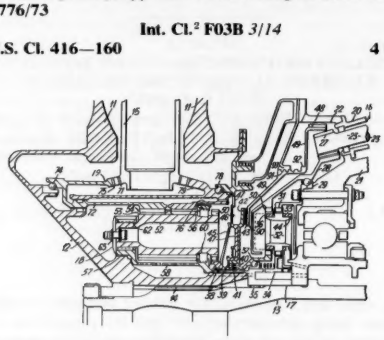


1. A rotary wing aircraft having a main rotor system including a rotor hub mounted for rotation about a generally vertical axis and a pluralty of rotor blades extending radially from the rotor hub, a vibration absorbing means mounted on the rotor hub, said vibration absorbing means comprising, in combination, a circular weight disposed around the axis of rotation for rotation with the rotor hub in a plane substantially perpendicular to the axis of rotation, the said weight being supported by resilient support means comprising at least three resilient supports arranged symmetrically about the axis of rotation and extending radially outwardly from inner attachments adjacent the axis of rotation to outer attachments on the weight so that, during rotation, the weight is capable of oscillation in any direction within its plane of rotation, and further support means for restraining the said oscillatory movements of the weight to be within the plane substantially perpendicular to the axis of rotation.

3,910,721
PITCH VARYING MECHANISMS FOR BLADED ROTORS

David Roberts McMurtry, Alveston, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Dec. 27, 1973, Ser. No. 428,714
Claims priority, application United Kingdom, Jan. 12, 1973, 1776/73
Int. Cl.[2] F03B 3/14
U.S. Cl. 416—160 4 Claims



1. A pitch varying mechanism for a variable pitch fan in which a plurality of fan blades are mounted on a rotor and a rotational shaft is provided for providing a drive to the rotor and wherein the mechanism comprises:

an actuator which is mounted stationary relative to the rotor and which is operable to produce a rotational output corresponding to the degree of pitch change required in the blades;

an epicyclic differential gear having two input gears one of which is driven by the shaft and the other of which is driven by said rotational output, and having an output corresponding to the sum of the shaft rotational speed and the actuator rotational output;

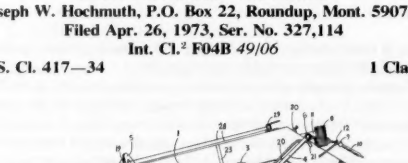
a pitch changing reduction gear having a pair of output gears and an input, the input corresponding to the output of the epicyclic differential gear, the output from the pitch changing reduction gear being in the form of relative rotation of the two output gears; means connecting the output gears with each fan blade to rotate the blades about their longitudinal axes to vary their pitch, and

further means selectively operable when the drive to the rotor stops for feathering the fan blades, said means comprising a clutch having two parts which are normally disengaged and which are adapted to be engaged and to disconnect the output of the differential gear from the pitch changing reduction gear and to connect the input of the pitch changing reduction gear to static structure.

3,910,722
PORTABLE IRRIGATION PUMP

Joseph W. Hochmuth, P.O. Box 22, Roundup, Mont. 59072

Filed Apr. 26, 1973, Ser. No. 327,114
Int. Cl.[2] F04B 49/06
U.S. Cl. 417—34 1 Claim

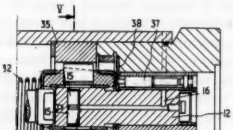


1. A portable irrigation pump comprising a frame supported by wheels adaptable for transport; a cross-member in the middle of said frame to form an A-shaped wishbone-type support; a saddle vertically mounted above each side of said frame and horizontally connected above a power source to form a transportable rest for the upper end of pump to set in; a pair of support arms hingedly mounted on each side of saddle and frame, upper end of said support arms hingedly and bracedly attached to a pump support hinge to lift pump head up out of saddle and hingedly set it down into the wishbone end of frame; said pump support hinge being fixedly mounted to upper end of pump; a winch fixedly mounted to frame; from said winch a cable extendable under said pump support hinge up to boom which extends upwardly and rearwardly from frame and said cable extending downwardly to lower part of pump; said power source securely mounted in said frame with a coupleable, turnable, flexible, reduceable drive train extending rearwardly connecting to pump shaft which is supported by a thrust bearing on said pump support hinge and which extends in and through the center of an elongated tubular conduit with an impeller fixedly mounted on opposite end of shaft and rotatable in a cone-shaped housing, said impeller held in position by a fin-support bearing, thus forming the pump; an intake scoop with shallow **180-degree** circular intake ports with Antiswire fins mounted and spaced to brace the scoop, said intake scoop hingedly mounted to said cone-shaped housing and controllable by cable and hand winch which is mounted on upper end of pump; a hose secured by clamp means to upper end of conduit which is a **45°** elbow to house a radiator and to permit said hose when inflated to extend out on the ground, or when rolled up, to be held to end of conduit by a flexible, attached by clamp, hose carrier that encircles the hose; an automatic shutoff arm, hingedly attached on a bracket that is mounted on underside of frame, one end of the arm resting on the hose, which is flexible and supported by internal water pressure, so that when the pressure drops, the hose collapses, triggering the arm causing other end to touch an electric terminal which grounds the ignition control, shutting off the power source; and a vent valve, mounted in top of pump, to alleviate vacuum caused by water leaving the tube when the pump is shut off.

3,910,723
FUEL INJECTION PUMPS FOR I.C. ENGINES

Jean Claude Bonin, Blois, France, assignor to Roto Diesel, Clichy, France

Filed Mar. 12, 1974, Ser. No. 450,431
Claims priority, application France, Mar. 14, 1973, 73.09050
Int. Cl.[2] F04B 19/02, 29/00, 49/00
U.S. Cl. 417—214 8 Claims



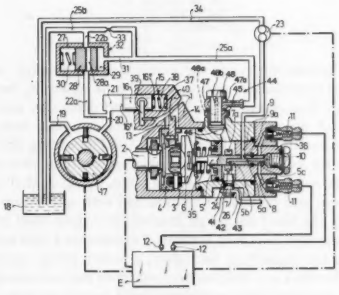
1. A fuel injection pump of the kind intended for supplying fuel to internal combustion engines and comprising a body part, a distributor member rotatable within the body part and adapted to be driven in timed relationship with an associated engine, a transverse bore in the distributor member, a pair of pumping plungers reciprocably mounted within the bore, a pair of shoes slidable in radial slots at the outer ends of said bore, said shoes engaging the plungers during inward movement of the shoes, cam engaging means carried by said shoes, an annular cam ring surrounding said distributor, cam lobes formed on the internal periphery of said cam ring and engag-

ing with said cam engaging means during rotation of the distributor member to impart inward movement to said shoes and plungers, fuel delivery means for conveying fuel displaced from said bore to a plurality of fuel outlets in turn, fuel inlet means for supplying fuel to said bore during the periods when the plungers can move outwardly, a carrier member axially slidable on the distributor member, slots in the carrier member in which are located said shoes, respectively, whereby axial movement of the carrier member will effect axial movement of said shoes, inclined surfaces on said shoes, a stop member carried by the distributor member, said stop member defining abutment surfaces engageable with the inclined surfaces on said shoes to limit the outward movement of the shoes whereby axial movement of the carrier member will vary the extent of outward movement of the plungers.

3,910,724
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Katashi Okamoto, Kariya, Japan, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Nov. 13, 1973, Ser. No. 415,411
Claims priority, application Japan, Nov. 14, 1972, 47-114575
Int. Cl.² F04B *23/12, 49/00;* **F02D** *1/06*
U.S. Cl. 417—206 **4 Claims**



1. In a fuel injection pump for internal combustion engines, including:

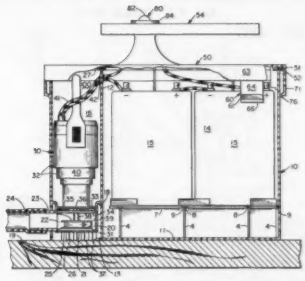
a. a pump piston;
b. means defining an injection pump working chamber;
c. means defining an injection pump relief channel, said relief channel being operatively associated with said working chamber;
d. cam drive means for driving said pump piston;
e. fuel feed pump means synchronously driven with said pump piston for feeding fuel through said relief channel to said working chamber in dependence on engine rpm;
f. a control piston;
g. means connecting said control piston to said fuel feed pump means;
h. means connecting said control piston to said cam drive means;
i. means defining a bypass chamber; and
j. means controlling the extent to which fuel flows through said relief channel to said bypass chamber, wherein a portion of the fuel feed quantity of the fuel injection quantity is caused to flow off through said relief channel to said bypass chamber in order to alter the fuel injection quantity by regulating said relief channel and by displacing said cam drive means by said control piston under the improvement comprising:

1. pressure regulating valve means;
2. means connecting said pressure regulating valve means to said bypass chamber; and
3. means connecting said pressure regulating valve means to said fuel feed pump means to regulate the pressure thereof, wherein the resultant pressure of the fuel quantity which flows off through said relief channel serves as a control pressure for said pressure regulating valve means.

3,910,725
PORTABLE PUMP APPARATUS

Clinton Rule, Gloucester, Mass., assignor to Rule Industries, Inc., Gloucester, Mass.

Filed Feb. 19, 1974, Ser. No. 443,444
Int. Cl.² F04B *21/00*
U.S. Cl. 417—234 **14 Claims**

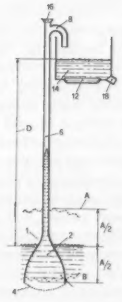


1. A portable pump enclosure assembly comprising a canister and a canister lid, said canister having a liquid-tight partition therein dividing the interior thereof into a pump compartment to receive therein electrically energized liquid pumping means and a battery compartment to receive therein an electric battery, gasket means sealably interposed between said canister and said lid to establish a liquid-tight closure of said battery compartment, conductor means to conduct energy from a battery housed within said battery compartment to a pumping means housed within said pump compartment, and switch means located on the battery compartment side of said enclosure assembly and in circuit with said conductor means.

3,910,726
WATER LIFTING DEVICE

Mario Tanferna; Alessandro Mascioli; Angelo Ciminelli; Franco Polo, and Carlo Boschetto, all of Via Ariosto 24, Rome, Italy

Filed July 16, 1974, Ser. No. 489,036
Claims priority, application Italy, July 16, 1973, 51494/73
Int. Cl.² F04F *7/00*
U.S. Cl. 417—240 **8 Claims**



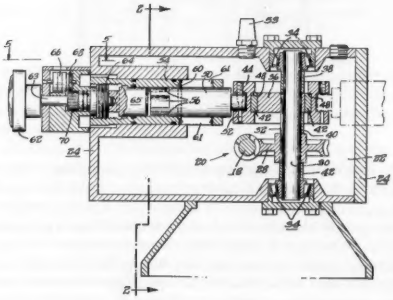
1. A water lifting device comprising a hollow body having an open bottom or inlet end immersed in a body of water and an also open upper or outlet end of a section narrower than said bottom end and extending in a delivery pipe ending in an

outlet located above the maximum expected height of the waves of said body of water, the narrowing of said upper end causing the acceleration of the waves rising within said hollow body, to project water through said delivery pipe.

3,910,727
METERING PUMP

Jac B. Flynn, Elgin, and Werner K. Priese, Barrington, both of Ill., assignors to Valve Systems International, Inc., Bala Cynwyd, Pa.

Division of Ser. No. 288,532, Sept. 13, 1972, Pat. No. 3,816,032. This application Mar. 18, 1974, Ser. No. 451,748
Int. Cl.[2] F04B 9/08
U.S. Cl. 417—387 **4 Claims**

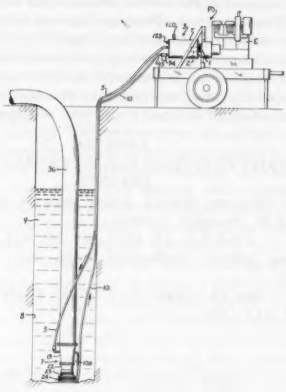


1. An improved pump which comprises: a housing having a cylinder therein and including a reservoir for operating fluid; a piston slidably mounted within said cylinder and providing a piston chamber; port means operatively connecting said piston chamber with said reservoir; drive means for effecting reciprocating movement of the piston whereby displacement of operating fluid may be effected; pumping head means operatively connected with said piston chamber and including flexible means and, which flexible means serves to define a portion of a chamber means for confining a volume of driving fluid between said piston and said flexible means, said flexible means being adapted to alternate between a first configuration and a second configuration during displacement of operating fluid in said chamber means; the improvement wherein said housing includes a relatively movable sleeve which defines said cylinder, said sleeve having said port means formed therein, said port means being defined by an annular groove formed in the inner surface of said sleeve, and at least one aperture opening to the outer surface of said sleeve and being in communication with said annular groove, means mounting said sleeve for axial movement relative to said piston and said housing, such that the point in the piston stroke wherein said piston blocks said port means and exerts compressive, displacement force on the operating fluid may be varied, thereby varying the displacement of said pump, said mounting means comprising a threaded coaxial extension on said sleeve, a threaded member mounted coaxially of said sleeve and in threaded driving engagement with said threaded extension operating means extending exteriorly of said housing for effecting rotation of said threaded member, and means journalling said threaded member to said housing in a fixed, axial position, whereby rotation thereof will produce axial movement of said sleeve relative to said piston.

3,910,728
DEWATERING PUMP APPARATUS

Albert H. Sloan, 4201 Kean Road, Fort Lauderdale, Fla. 33314

Filed Nov. 15, 1973, Ser. No. 415,997
Int. Cl.[2] F04B 9/08
U.S. Cl. 417—390 **6 Claims**

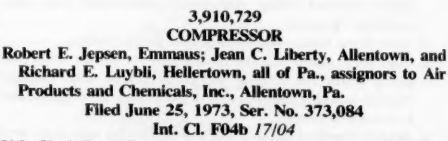


1. Dewatering pumping apparatus comprising, a mobile internal combustion engine, a fluid tank assembly including a pressure fluid pump connected to and driven by said engine, said tank assembly including an enclosed fluid storage tank and a mounting plate for said tank, said mounting plate having means for connection to said engine, whereby said tank may be removed from said mounting plate, pump control means in said tank and operatively connected with said pump for controlling the fluid discharge thereof, and float level regulating means in said tank and operatively connected with said power source for regulating the latter, a water pump assembly for being located in a hole to be dewatered and including a housing, a pressure fluid motor mounted in said housing, flexible fluid conduits connected between said motor and said tank assembly for conducting pressure fluid therebetween to drive said motor, an impeller in said housing and connected to said motor for being rotationally driven by said motor to thereby pump water from said hole.

3,910,729
COMPRESSOR

Robert E. Jepsen, Emmaus; Jean C. Liberty, Allentown, and Richard E. Luybli, Hellertown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed June 25, 1973, Ser. No. 373,084
Int. Cl. F04b 17/04
U.S. Cl. 417—417 **20 Claims**



1. A compressor for pressurizing a fluid comprising in combination:

an elongate generally cylindrical closed housing having a major and minor axis and a first and second end defining first and second chambers in said housing;

a first piston and cylinder disposed in the first chamber and mounted for relative reciprocation thereby defining a first variable volume fluid chamber;

a second piston and cylinder disposed in the second chamber and mounted for relative reciprocation thereby defining a second variable volume fluid chamber;

the first and second piston and cylinder combination mounted relative to each other for reciprocation along the major axis of the housing;

means associated with each independent piston and cylinder combination to cause reciprocating motion of each piston and cylinder independent of the other; and

means for admitting and removing a fluid to the first and second variable volume chambers.

3,910,730

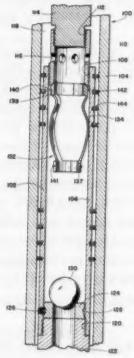
OIL WELL PUMP

Lonnie L. Gage, Rte. 3, Box 158, Walters, Okla. 73572

Continuation-in-part of Ser. No. 301,832, Oct. 30, 1972, abandoned. This application Feb. 22, 1974, Ser. No. 445,285

Int. Cl.[2] F04B *21/04*

U.S. Cl. 417—554 **7 Claims**



1. A subsurface well pump comprising a first elongated stationary tubular member in communication with a well fluid reservoir, a second elongated tubular member in communication with the well fluid and concentrically arranged with respect to the stationary tubular member and reciprocal with respect thereto, check valve means disposed within one of said tubular members to provide alternate open and closed positions for the pump during operation thereof, piston ring means provided on the outer periphery of one of said tubular members and engagable with the inner periphery of the other of said tubular members to provide a maximum fluid seal therebetween with a minimum of frictional drag for substantially precluding bypassing of the well fluid between the tubular members during operation of the pump, said piston ring means including at least one relatively thin annular metallic ring having the central bore thereof concentric with the outer circumference thereof, said valve means including valve seat means removably secured within said one tubular member, ball means loosely disposed within said one tubular member and cooperating with the valve seat means for providing said alternate open and closed positions for the pump, and limit means carried by one of said tubular members for limiting the movement of the ball means in one direction during operation of the pump while maintaining a maximum fluid flow through the pump, said limit means comprising tension spring means disposed within one of said tubular members and in a pressure engagement with the inner periphery thereof.

3,910,731

SCREW ROTOR MACHINE WITH MULTIPLE WORKING SPACES INTERCONNECTED VIA COMMUNICATION CHANNEL IN COMMON END PLATE

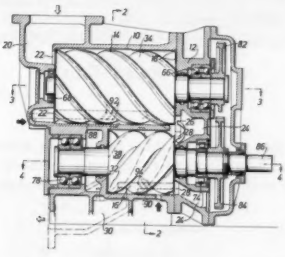
Walther Persson, Johanneshov, and Lauritz Benedictus Schibbye, Saltsjo-Duvnas, both of Sweden, assignors to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 158,176, June 30, 1971, abandoned. This application Oct. 31, 1973, Ser. No. 411,224

Claims priority, application United Kingdom, July 9, 1970, 33405/70

Int. Cl. F01c *1/16, 11/00;* **F04c** *23/00*

U.S. Cl. 418—9 **13 Claims**



1. Screw rotor machine for an elastic working fluid comprising:

a casing enclosing at least two working spaces, each generally comprising two intersecting bores with parallel axes and provided with barrel walls, with low pressure and high pressure end walls perpendicular to said axes, and with low pressure and high pressure ports disposed in said walls;

a pair of intermeshing rotors respectively disposed in each working space, each rotor provided with helical lands and intervening grooves having a wrap angle of less than 360°, each pair of intermeshing rotors comprising one rotor of male rotor type and one rotor of female rotor type; and a transmission chamber housing a power transmission, one rotor of each stage being further interconnected by said power transmission disposed in said separate transmission chamber;

the improvement wherein the casing comprises:

a common barrel member enclosing at least the major portions of the working spaces in parallel side by side; and

an end plate member directly connected to said barrel member, said end plate member having:

one common plane surface constituting an end wall of each of said working spaces;

means for carrying bearings for all the rotors;

means for enclosing said transmission chamber; and

depressions in said common plane surface which form at least portions of a communication channel between said working spaces.

3,910,732

GEROTOR PUMP OR MOTOR

Gavril T. Lusztig, Cranston, R.I., assignor to Webster Electric Company, Inc., Racine, Wis.

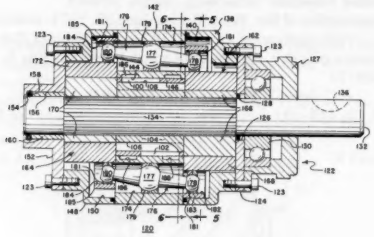
Filed Aug. 19, 1974, Ser. No. 498,373

Int. Cl.[2] F01C *1/02;* **F03C** *3/00;* **F04C** *1/02*

U.S. Cl. 418—60 **21 Claims**

1. A fluid pump or motor comprising: a casing having inlet and outlet ports; a shaft mounted in said casing for rotation about its longitudinal axis; a pair of assemblies axially spaced apart on said shaft, each assembly including an inner member mounted for rotation with said shaft having external gear means meshing with internal gear means on the inside of an outer member mounted for orbital movement on said casing,

means including said gear means forming a plurality of fluid chambers surrounding said shaft; passage means in communication between a first group of said chambers and one of said ports and between a second group of said chambers and the



other of said ports; and drive link means mounted on said casing and interconnecting said outer members to maintain said outer members in a predetermined orbital phase relationship.

3,910,733

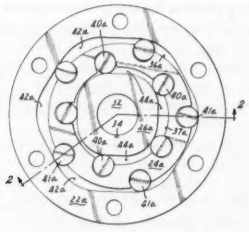
ROTARY MECHANISM HAVING AT LEAST TWO CAMMING ELEMENTS

Leslie H. Grove, 707 E. Hoyt Ave., St. Paul, Minn. 55106

Continuation-in-part of Ser. No. 143,869, May 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 859,117, Sept. 18, 1969, abandoned. This application June 11, 1973, Ser. No. 368,871

Int. Cl.[2] **F01C** *1/02;* **F03C** *3/00;* **F04C** *1/02;* **F01C** *1/10*

U.S. Cl. 418—61 B **16 Claims**



1. A rotary mechanism comprising a first camming element and

a second camming element having its inner face in contact with the outer face of the first camming element,

one of the contacting pair of said faces having a cam profile of at least three identical segments, each segment including a first axially-straight, radially-circular surface connected to the adjacent first surface by a second radially-circular surface of a different radius which is tangent to the first surface and may be infinity, the other of the contacting pair of faces having at least three equally spaced rollers in oversize U-shaped sockets permitting radial movement, which sockets are connected by a surface which does not interfere with the cam profile, and

the number of rollers differing by at least one from the number of cam segments, each roller being in contact with the cam profile during rotation of one camming element relative to the other when the rotary mechanism is used as a fluid pressure device.

3,910,734

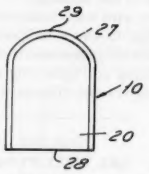
COMPOSITE APEX SEAL

Yeshwant P. Telang, Grosse Ile, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 20, 1973, Ser. No. 390,133

Int. Cl.[2] **F01C** *21/00*

U.S. Cl. 418—178 **4 Claims**



1. An apex seal for a rotary internal combustion engine and having surfaces to be sealed, comprising:

a. a supporting portion defined to extend between said surfaces and is comprised of a metal consisting essentially of aluminum and having a specific gravity no greater than 3.0 and a modulus of elasticity no less than 12 million p.s.i.,

b. a wear-resistant coating substantially enveloping said supporting portion and having a thickness between 0.015 inches and 0.025 inches, said coating being comprised of an admixture of two different types of abrasion resistant particles having a particle size no greater than 74 microns, said particles being self-fused to each other providing limited porosity of 2–5%, said coating being mechanically locked to said supporting portion with a uniform adhesive force no less than 8,500 p.s.i. as determined by an epoxy test procedure, said adhesive force resulting from the impaction of said abrasion resistant particles against said supporting portion by a plasma jet having a flow velocity in excess of Mach I.

3,910,735

APPARATUS FOR MOLDING AND CURING A PNEUMATIC TIRE IN A PERFECTLY CENTERED POSITION WITH RESPECT TO THE EQUATORIAL PLANE OF THE CURING MOLD

Renato Caretta, Cedrate di Gallarate, Italy, assignor to Industrie Pirelli, S.p.A., Milan, Italy

Continuation of Ser. No. 295,916, Oct. 10, 1972, abandoned. This application Nov. 19, 1974, Ser. No. 525,090

Claims priority, application Italy, Oct. 15, 1971, 29916/71

Int. Cl.[2] **B29H** *5/02, 5/08*

U.S. Cl. 425—46 **10 Claims**

1. An apparatus for molding and curing a pneumatic tire which includes a mold constituted by

two continuous annular sections corresponding to the tire side-walls and

an intermediate section constituted by a plurality of sectors, radially displaceable in both directions, provided on their inner faces with radial sculptures corresponding to the grooves of the profile to be molded on the tread band and means for admitting and discharging a compressed fluid inside

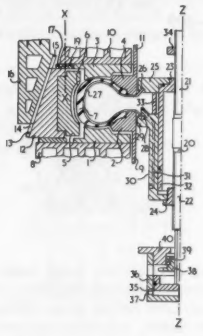
and from said pneumatic tire

said apparatus comprising

at least a continuous annular portion of each of said annular sections axially displaceable in both directions relatively to the remaining part of the annular section and symmetrically with respect to the corresponding portion of the opposite section and to the median plane of the mold

means to bring only said displaceable continuous annular portion into contact with the corresponding portion of the tire sidewall outer surface

means to radially displace said sectors against the tread band whereby a strictly symmetrical partial molding of the tread pattern is obtained, the tire being supported on each sidewall only at the surface of said displaceable continuous annular portion and being maintained by the



latter centered and fixed with respect to the equatorial plane of the mold

means to bring the remaining part of the tire outer surface into contact with the corresponding mold surfaces, whereby an expansion of the tire is obtained, with the consequent complete molding of the tread pattern.

3,910,736
TOOL LOCKING DEVICE WITH TIE RODS, PARTICULARLY FOR PLASTICS INJECTION MOLDING MACHINES

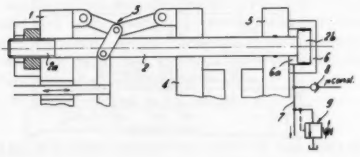
Albert Stächelin, Hinwil, and Rudolf Krebser, Weesen, both of Switzerland, assignors to Maschinenfabrik und Giesserei Netstal AG, Switzerland

Filed June 3, 1974, Ser. No. 475,994

Claims priority, application Switzerland, June 6, 1973, 8157/73

Int. Cl.[2] B29F *1/06*; **B30B** *15/24, 15/28*

U.S. Cl. 425—137 **4 Claims**



1. A tool locking device with tie rods, particularly for plastics injection molding machines, comprising, in combination, a first tool support movable along said tie rods; a locking mechanism bearing against first ends of said tie rods; a second tool support mounted on said tie rods adjacent the opposite ends thereof; said locking mechanism being connected to said first tool support and operable to lock said first tool support in closing relation with said second tool support; means forming respective hydraulic cushions between said second tool support and said opposite ends of said tie rods; a common connection line connected to all of said hydraulic cushions and establishing intercommunication therebetween; hydraulic pressure limiting means connected to said common connection line; a fluid outlet valve connected to said common connection line; a pressure controller connected to said common connection line; a first switch actuated by said pressure controller responsive to a predetermined increase in pressure in said hydraulic cushions; a second switch actuated by said first tool support responsive only to said first tool support reaching the correct locking position; and a circuit interconnecting said first and second switches and said fluid outlet valve; said fluid outlet valve being closed only responsive to actuation of both said first and said second switches.

3,910,737
APPARATUS FOR AUTOMATICALLY MOLDING TABLETS INCLUDING SIZE AND WEIGHT CORRECTION

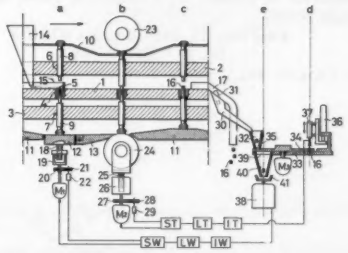
Yasuo Shimada, 104, Minamikamiai-cho, Nishinokyo, Nakakyo-ku, Kyoto, and Giichiro Kowada, 3, Inoke-cho, Hanazono, Ukyo-ku, Kyoto, both of Japan

Filed Apr. 15, 1974, Ser. No. 460,986

Claims priority, application Japan, Nov. 30, 1973, 48-135948

Int. Cl.[2] B30B *11/08*

U.S. Cl. 425—140 **1 Claim**



1. A machine for moulding tablets from powder, comprising in combination:

a. horizontal turntable (**1**) having at least one vertical die chamber (**5**) therein;

b. a hopper (**14**) disposed over the outer periphery of said turntable (**1**) including feed chute means for feeding powder to said die chamber (**5**);

c. upper and lower punch guide blocks (**2, 3**) with vertical upper and lower punches (**8, 9**) each including a punch head thereon disposed to reciprocate in said guide blocks and enter said die chamber (**5**) at a compressing moulding position;

d. upper and lower compression rolls (**23, 24**) so disposed over and under said compressing moulding position as to engage said punch heads as they pass before said rolls, and press said punches into said die to compress powder therein;

e. an exit chute disposed at the outer periphery of said turntable (**1**) to receive a moulded tablet;

f. upper guide rail means disposed over said turntable engaging said upper punch head and guiding it from a position where the punch does not engage the die to a position where the punch does engage the die;

g. lower guide rail means disposed under said turntable engaging said lower punch head and guiding it from a first position where said lower punch goes through the die and ejects a moulded tablet to a second position within the die defining the amount of powder fed to the die and to a third position over said lower roll defining the amount of compression exerted by said lower roll, said lower guide rail means including an adjustable weight rail defining the vertical penetration of the punch in the die fixing the amount of powder fed to the die from said feed chute means;

h. horizontal moving means with an aperture (**35**) therein disposed under said exit chute to receive formed tablets thereon and move some tables thereon, other tablets passing through said apertures;

i. measuring means (37) disposed adjacent said longitudinal moving means for measuring the size of said formed tablets;

j. weighing means (38) disposed under said aperture to receive a formed tablet thereon and weigh the tablet;

k. first and second vertical adjustment means (19, 26) under both said weight rail and said lower roll to adjust the amount of penetration of said lower punch into said die when said die receives powder and when said tablet is formed; and,

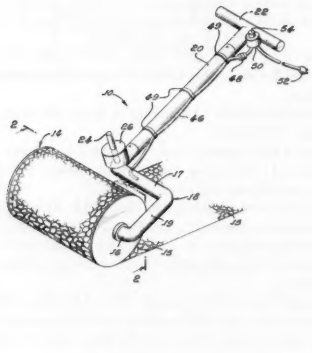
l. feedback means from said measuring means (37) and said weighing means (38) to said first and second adjustment means to adjust said adjustment means in accordance with predetermined tablet size and weight in response to the size and weight information provided by said measuring means and weighing means.

3,910,738

CONCRETE FINISHING ROLLER

Jack A. Chandler, 1783 Tallac St., Napa, Calif. 94558, and Hendrick de Kanter, 9772 Rangeview Drive, Santa Ana, Calif. 92680

Filed May 15, 1969, Ser. No. 825,014
Int. Cl.[2] B28B *11/08*
U.S. Cl. 425—162 **2 Claims**



1. A device for embossing a textured finishing design into an impressionable surface comprising:

a handle member having a lower generally U-shaped portion;

a generally cylindrical shaped roller having an embossed finishing design on its outer surface rotatably mounted on one leg of said U-shaped portion of said handle member;

means mounted on said handle member for varying the weight of said device to vary the depth of impression made in said impressible surface by said embossed finishing design of said roller;

vibrating means mounted on said handle member for vibrating said device to facilitate impressing said embossed finishing design of said roller into said impressible surface and the resulting impression of a textured finishing design; and

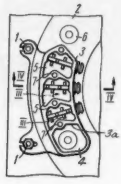
wherein said roller comprises two end pieces and a removable outer surface, said end pieces being adapted to receive an extension bushing for increasing the diameter of said roller.

3,910,739

FEEDING DEVICE FOR A ROTARY TABLET MACHINE

Nikolai Semenovich Talis, ulitsa Zhelyabova, 13, kv. 28, and Vitaly Ivanovich Matjushenko, ulitsa Sovetskaya, 10, kv. 21, both of Angarsk, U.S.S.R.

Filed Dec. 21, 1973, Ser. No. 427,410
Int. Cl.[2] B30B *15/30*
U.S. Cl. 425—209 **2 Claims**



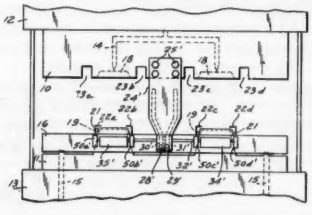
1. A feeding device for a rotary tablet machine for compressing powder, the machine including a rotor with a toothed rim and a rotary table having molds defining cavities mounted therein for the tablets, the device comprising: a frame which partitions defining a receiving compartment and delivery compartments communicating with one another, said frame being non-rotatably mounted above said rotary table, said partitions having apertures made therethrough, corresponding to the diameter of said mold cavities and extending from the bottom to the top of said partitions, said apertures communicating the interior of said molds with the ambient atmosphere as said molds are filled with the powder.

3,910,740

EJECTION-CONTROL SYSTEM FOR INJECTION-MOLDING MACHINE

Herbert Rees, Willowdale, Canada, assignor to Husky Injection Molding Systems, Bolton, Canada

Filed Mar. 27, 1974, Ser. No. 455,318
Int. Cl.[2] B29F *1/14*
U.S. Cl. 425—242 R **9 Claims**



1. In an injection-molding machine including relatively reciprocable first and second mold portions defining at least one cavity, drive means for periodically closing and opening said mold portions, injection means for admitting plastic material into said cavity in a mold-closed position, and ejection means for dislodging a molded article from said cavity in a mold-open position, the combination therewith of a mechanism for guiding molded articles down from said cavity in the mold-open position, said mechanism comprising:

track-forming means on said first mold portion including at least one pair of generally vertical rails extending downwardly from the vicinity of said cavity and bracketing same, said rails being transversely shiftable with relatively wide spacing in a retracted position and relatively close spacing in an operative position; and

control means synchronized with said drive means for moving said rails into said operative position during a mold-opening stroke to intercept a molded article and into said

retracted position during a mold-closing stroke to facilitate molding of another article.

3,910,741

APPARATUS FOR COLLECTING SURPLUS PLASTIC MATERIAL WHICH IS SEPARATED FROM BLOW MOLDED ARTICLES

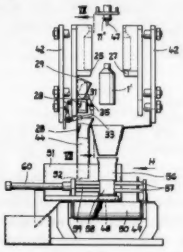
Gottfried Mehnert, Berlin, Germany, assignor to Conduco AG, Zug, Switzerland

Continuation of Ser. No. 145,972, April 28, 1971, abandoned. This application Sept. 6, 1973, Ser. No. 394,723

Claims priority, application Germany, Apr. 30, 1970, 16308; Feb. 24, 1971, 08693

Int. Cl.[2] B29C *1/00, 7/00*

U.S. Cl. 425—302 B **4 Claims**



1. In a blow molding apparatus, a combination comprising an open-and-shut mold having sections movable between open and closed positions and frame means for said sections, said frame means being movable with said sections between a first and a second station; means for supplying said mold with deformable synthetic thermoplastic blanks at said first station; means for expanding a blank in said mold at said second station with attendant conversion of the blank into a hollow article and surplus material which adheres to the article; means for effecting removal of articles from said mold before said frame means and said sections return from said second to said first station; means for transporting the thus removed articles along a first predetermined path; means for separating at least some surplus material from the articles; and means for intercepting the thus separated material and for introducing the intercepted material into a second predetermined path so that the separated material is prevented from contacting articles in said first path, saaid intercepting means comprising duct means mounted on said frame means and arranged to register with said separating means while said frame means and said sections dwell at said first station.

3,910,742

APPARATUS FOR REMOVING WASTE MATERIAL FROM A PLASTIC ARTICLE

Kenneth N. Lynn, Overland Park, Kans., assignor to Ethyl Development Corporation, Kansas City, Mo.

Continuation of Ser. No. 217,788, Jan. 24, 1972, abandoned. This application Nov. 21, 1973, Ser. No. 417,925

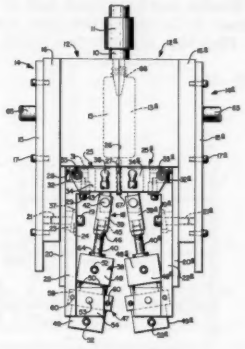
Int. Cl.[2] B29C *17/14*

U.S. Cl. 425—302 B **11 Claims**

1. In an apparatus for blow molding hollow, plastic articles from tubular plastic parisons which includes a split blow mold having two halves, two individual mold suport means, one of each support means being attached to one of each individual mold half and extending below the bottom forming end of the respective mold half, power means to move each individual support means and each associated mold half to open and close said split blow mold; said hollow plastic article while being enclosed and supported by said mold halves having a tail attached thereto which depends from the bottom forming ends of said mold halves; an improved tail grasping assembly for removing said tail from said hollow article comprising:

a. a first and a second assembly support means, said first assembly support frames being adjustably attached to one of said two mold support means and said second assembly support frame being attached to the other of said mold support means, said first and second assembly support frames being positioned below said bottom-forming ends of said mold halves;

b. first and second fluid power cylinders, said first fluid power cylinder being attached to said first assembly support frame and said second fluid power cylinder being attached to said second support frame, said first and second cylinders each having a piston rod extending



therefore towards said bottom-forming end of said mold halves; and

c. first and second grasping arms, said first grasping arm being pivotally attached to said first assembly support and to said first piston rod, and said second grasping arm being pivotally attached to said second assembly support frame and to said second piston rod, said first and second grasping arms being located immediately adjacent to the bottom-forming end of said mold halves and together adapted to engage between them the depending tail for removal from said hollow article upon actuation of said first and second fluid power cylinders.

3,910,743

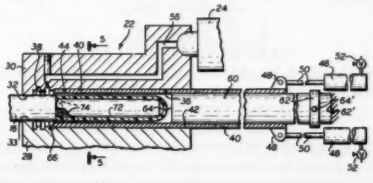
APPLICATION OF PARISON TO BALLOON COVERED CORE ROD

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Greenbrook, N.J.

Filed Oct. 4, 1974, Ser. No. 512,250

Int. Cl.[2] B29F *1/00*

U.S. Cl. 425—249 **13 Claims**



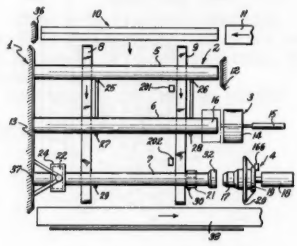
1. Injection blow molding apparatus including core rods, an injection mold, a blowing mold, supporting structure for the core rods movable to transfer the core rods from one mold to the next, means for injecting semi-liquid plastic into the injection mold, the injection mold having an opening at one end through which a core rod extends into a cavity in the injection mold, a tube that extends into the cavity from the gnd opposite the core rod, the tube being in axial alignment with the core

rod and having an inside diameter slightly greater than the outside diameter of the core rod so that there is some clearance between the core rod and the tube, a bearing on which the tube moves axially to withdraw the tube from the cavity, means for stopping the withdrawing of the tube when the end face of the tube reaches a position where it constitutes, in effect, a part of an end wall of the cavity, and a wall in the tube constituting, in effect, another part of the end wall of the cavity.

3,910,744
APPARATUS FOR BELLING PLASTIC PIPE

Clifford P. Ronden, and Imre Rabel, both of Edmonton, Canada, assignors to Grandview Industries, Limited, Canada

Filed May 28, 1970, Ser. No. 41,267
Int. Cl. B29c *17/07*
U.S. Cl. 425—384 **16 Claims**



1. In an apparatus for belling an end of a thermoplastic pipe, the combination of

a belling head;

means for positioning a pipe in axial alignment with said belling head comprising

endless conveyor means arranged to move the pipe in a direction which is transverse both to the length of the pipe and said belling head, and

means at the location of said belling head for receiving the pipe on said conveyor means, aligning the pipe with said belling head, and supporting the pipe in the resulting position of alignment;

power means for effecting relative axial movement between said belling head and the adjacent end of the pipe to engage the belling head and pipe during belling to separate the belling head and pipe after belling;

means for heating said end of the pipe to a softening temperature prior to engagement between said end and said belling head; and

means for cooling said end of the pipe while the same is still engaged with said belling head.

3,910,745
TUBE SHAPING APPARATUS

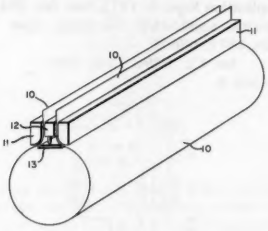
Alan Campbell Knight, Vienna, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 14, 1974, Ser. No. 451,118
Int. Cl. B29c *17/04, 17/07*
U.S. Cl. 425—387 R **3 Claims**

1. A device for minimizing the seam formed longitudinally along the exterior of heat-shrinkable plastic tubing when the tubing is prepared by pressurizing and heating the interior of an expandable plastic tubing until it is expanded against a cylindrical-like sheet surrounding the plastic tubing, which cylindrical-like sheet has been formed by looping the sheet and clamping the looped ends with longitudinal clamps, which comprises

a. a pair of opposing clamps having opposing surfaces for clamping the looped flexible sheet, said clamps extending longitudinally along the length of the looped sheet and positioned to clamp the looped ends of the sheet, said clamps each having a shaped surface along the edge that abuts the looped sheet where the looped ends enter between the clamps,

b. a spacer positioned between said clamps and between the opposing looped ends of the sheet, extending longitudinally the length of the clamps, said spacer having means for receiving and fastening a plate which extends into the closure formed by the looped sheet,



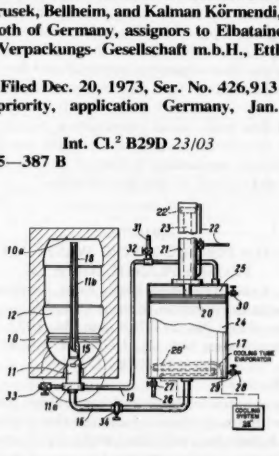
c. a longitudinally flexible plate within the closure formed by the looped sheet extending longitudinally the length of the clamps, constructed and arranged to be fastened to said spacer at said means for receiving and fastening a plate, so that the plane of the plate is perpendicular to the opposing surfaces of the clamps, said plate having shaped portions along each longitudinal edge thereof constructed and positioned to conform with and match the shaped surface of each said clamp when in abutting position therewith, and

d. means for adjusting the position of said plate relative to said spacer.

3,910,746
APPARATUS FOR MANUFACTURING HOLLOW ARTICLES OF THERMOPLASTIC RESIN BY BLOWING

Wilfried Mrusek, Bellheim, and Kalman Körmendi, Karlsruhe, Baden, both of Germany, assignors to Elbatainer, Kunststoff- und Verpackungs- Gesellschaft m.b.H., Ettlingen, Germany

Filed Dec. 20, 1973, Ser. No. 426,913
Claims priority, application Germany, Jan. 4, 1973, 2300234
Int. Cl.[2] B29D *23/03*
U.S. Cl. 425—387 B **7 Claims**



5. An apparatus for manufacturing hollow articles from thermoplastic resin, comprising

an upright blow mold,

a blowing and filling mandrel extending upwardly within said blow mold from the bottom to close to the top closure edges of said blow mold,

said mandrel being formed with inlet and outlet channels communicating with lower and upper regions of the inte-

rior of a hollow article to be produced for blowing air and for coolant, respectively,

cylindrical storage container means having a coolant supply region and an air space region,

conduit means for said blowing air and for said coolant, respectively, connected over separate paths with said storage container means to the coolant supply region and to said air space region, respectively, and

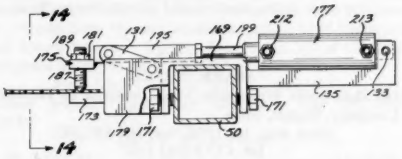
a heat-exchange means in said coolant supply region.

3,910,747

APPARATUS HAVING IMPROVED SHEET CLAMPING MEANS FOR FORMING PLASTIC SHEETS

Donald E. Dean, San Pedro, and John Alesi, Jr., Topanga, both of Calif., assignors to Formex Manufacturing, Inc., Venice, Calif.

Filed Sept. 23, 1974, Ser. No. 508,703
Int. Cl.² B29C *17/04*
U.S. Cl. 425—397 **11 Claims**



1. In a vacuum-forming machine having transfer means including at least one open frameworks formed of frame bar members for transferring sheets of thermoplastic to a heating station and positioning said sheets therein between heating elements where said sheets are heated to a forming temperatures and to a molding station and positioning said sheets therein between opposed die faces where said sheets are molded into a formed product, the improved sheet clamping means carried on said transfer means which comprises a clamping assembly carried on at least one of said frame bar members for engaging an edge of said thermoplastic sheet, including opposed jaws carried by said assembly to grip opposite sides of said sheet with at least one of said jaws being pivotally mounted on said clamping assembly and including a reciprocable piston and cylinder actuator therefore having fluid pressure ports at opposite ends of said cylinder, a source of pressure fluid, selector valve means and conduits between said source of pressure fluid, valve means and ports whereby pressure fluid can be applied to a selected one side of said piston and exhausted from the opposite side thereof and pressure fluid bleed means carried by said actuator whereby a continuous flow of pressure fluid can be maintained through said actuator.

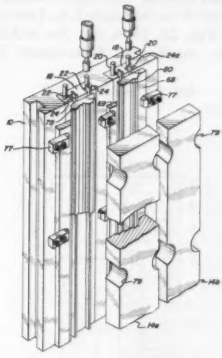
3,910,748

PLASTIC MOLD CONSTRUCTION

Dror Kopernik, Chicago, Ill., assignor to Turner Mfg. Co., Chicago, Ill.

Continuation of Ser. No. 237,417, March 23, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 460,956
Int. Cl.² B29C *7/00;* **B29D** *27/00;* **B29G** *7/02*
U.S. Cl. 425—444 **9 Claims**

1. In a machine for molding an elongated board formed of foamed thermoplastic and having opposed elongated surfaces one of which is decorative, so as to be adapted for viewing, and wherein there are two platens which in one position enclose a molding space and in another position open the molding space to permit removal of the molded product, the improvement comprising a plurality of mold parts which when brought together define a mold cavity for molding the elongated board product having both said longitudinal surfaces thereon, one of the mold parts adjacent the surface opposite said ornamented surface providing nozzle means through which foamed thermoplastic material to be molded is to be introduced into the mold cavity, said one mold part having at least one elongated slot extending thereacross and located relative to the mold cavity so that portions of the mold cavity bridge the entire width of said elongated slot, an elongated ejector bar slidably positioned in the slot with one edge arranged so that the entire width of the bar serves as a surface-defining portion of said one mold part and as a mold part to which the surface opposite the ornamented surface of the product will adhere during production, the ends of said ejector



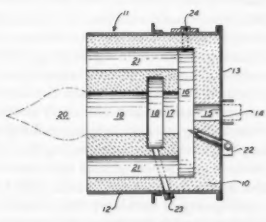
bar extending laterally beyond the one mold part to provide means for actuating the bar within the slot to move the surface-defining edge thereof outwardly of the one mold part to effect release of the product from the remainder of the mold part while the product remains adhered to the bar edge across its entire width, and means positioned to move to impact against an end portion of the product adhered to the bar to cause the product to be dislodged from the bar.

3,910,749

INDUCTION BURNER

James T. Voorheis, 18 Smull Ave., Lake Hiawatha, N.J. 07006

Filed Oct. 11, 1974, Ser. No. 514,005
Int. Cl.² F23L *17/00*
U.S. Cl. 431—116 **10 Claims**



1. An induction burner comprising:

a. an elongated refractory body,

b. a first passage at the front of the body for the introduction of fuel,

c. a first chamber in the body connected with the first passage, and defining a header for induction ports,

d. a second passage in the body communicating with the first chamber,

e. a second chamber in the body communicating with the second passage, and defining a radially dead end flame eddy cavity,

f. an elongated chamber having an opening to the ambient in a back face of the body, connected to the second chamber, and defining a flame tunnel, said second cham-

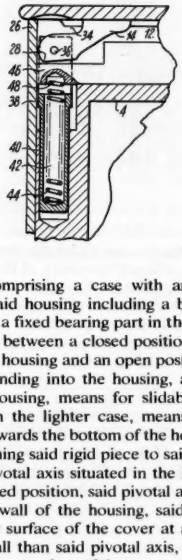
ber being substantially larger in a radial direction than said second passage and said elongated chamber,

g. an induction port open to the ambient and located in the back face of the body adjacent the opening in the elongated chamber, connected with the header.

3,910,750
CIGARETTE LIGHTER

Andre Guenin, and Conrad Zellweger, both of Geneva, Switzerland, assignors to La Nationale S.A., Geneva, Switzerland

Filed Feb. 25, 1974, Ser. No. 445,659
Claims priority, application Switzerland, Mar. 2, 1973, 3079/73
Int. Cl.[2] F23Q *25/00*
U.S. Cl. 431—150 **3 Claims**



1. A lighter comprising a case with an outwardly-open burner housing, said housing including a bottom and a side wall with an edge, a fixed bearing part in the housing, a cover pivotally mounted between a closed position in which it rests on the edge of the housing and an open position, a rigid piece on the cover extending into the housing, a mobile member disposed in the housing, means for slidably mounting said mobile member in the lighter case, means for biasing said mobile member towards the bottom of the housing, and means for pivotally attaching said rigid piece to said mobile member about a mobile pivotal axis situated in the housing when the cover is in the closed position, said pivotal axis situated in the proximity of said wall of the housing, said rigid piece connected to an inner surface of the cover at a location further away from said wall than said pivotal axis, means defining a gap between the inner surface of the cover and said rigid piece to receive said wall when the cover is in the open position, said rigid piece including means defining a cam profile cooperating with said fixed bearing part of the housing to displace the pivotal axis towards the opening when the cover is pivoted from the closed position towards the open position, said mobile member including means defining a longitudinal blind bore and a pair of fork-like arms extending from the open end of the blind bore in said housing, said rigid piece being pivotally connected to the ends of said arms, said biasing means comprising a coil spring in said bore and a fixed stop between said arms cooperating with the spring to bias said ends of said arms towards the bottom of the housing.

3,910,751
SPARK WHEELS, METHOD OF MANUFACTURING SPARK WHEELS, AND DIES FOR USE THEREIN

Stephen P. Chernock, Flax Mill Lane, Milford, Conn. 06460

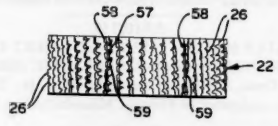
Filed Jan. 7, 1974, Ser. No. 431,062
Int. Cl.[2] F23Q *1/02*
U.S. Cl. 431—273 **9 Claims**

1. A spark wheel having a substantially right cylindrical shape incorporating an abrasive peripheral surface comprising:

A. a plurality of grooves forming lands therebetween at an angle to the sides of the wheel; and

B. a plurality of raised flint cutting teeth randomly distributed throughout said lands and comprising

a. a first plurality of raised flint cutting teeth cut across said lands and extending between adjacent grooves formed by at least two intersecting surfaces and incorporating a terminating edge at the apex of said intersecting surfaces and

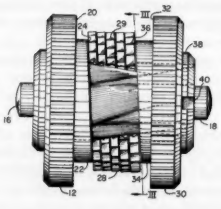


b. a second plurality of raised flint cutting teeth cut into said first plurality of raised flint cutting teeth and extending between adjacent grooves formed by at least two intersecting surfaces and incorporating a terminating edge at the apex of said intersecting surfaces.

3,910,752
SPARK WHEEL

Brian Holl, South Weymouth, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Aug. 14, 1974, Ser. No. 497,382
Int. Cl.[2] F23Q *1/02*
U.S. Cl. 431—273 **6 Claims**

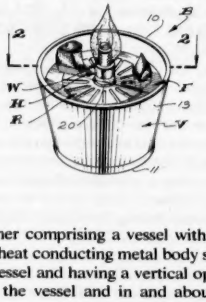


1. A spark wheel comprising a stack of segments having cutting teeth, with at least some, but not all, of the teeth on each segment lying outside a plane passing through that segment perpendicularly to the axis of said stack.

3,910,753
WAX BURNER

George Y. Lee, 200 Miguel Place, Fullerton, Calif. 92635

Filed Apr. 15, 1974, Ser. No. 460,885
Int. Cl.[2] F23D *3/16*
U.S. Cl. 431—290 **3 Claims**



1. A wax burner comprising a vessel with a bottom, sides and open top, a heat conducting metal body supported on the bottom in said vessel and having a vertical opening therein, a mass of wax in the vessel and in and about said body, an

elongate vertical wick engaged in the opening with its lower portion within said wax and having an upper portion projecting from within said opening and the wax, said wick comprising an elongate vertical heat conducting metal core, a fibrous sleeve engaged about and supported by said core and a heat conducting metal tube slidably engaged in said opening and slidably engaged about said sleeve whereby the tube can be shifted vertically relative to the sleeve to vary the extent of exposed sleeve at the upper end of the wick and said tube can be shifted vertically in the opening to vary the vertical position of the upper end of the wick above the body.

3,910,754

APPARATUS AND METHODS FOR HEAT TREATING FINE-GRAINED MATERIALS

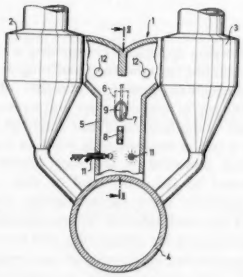
Paul Weber, Oelde; Hans Mollenkopf; Kurt Henning, both of Neubeckum; Otto Heinemann, Ennigerloh; Heinz-Herbert Schmits, Rheda; Wolfgang Rother, Stromberg; Horst Ritzmann, Enniger; Jürgen Wurr, Ennigerloh; Karl Krutzner, Jr., Neubeckum; Werner Schössler, Ahlen; Wolf Goldmann, and Georg Schepers, both of Ennigerloh, all of Germany, assignors to Polysius AG, Neubeckum, Germany

Filed May 13, 1974, Ser. No. 469,112

Claims priority, application Germany, May 15, 1973, 2324519

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—11 **22 Claims**



1. A method of preheating fine-grained material prior to its discharge to a furnace from which hot combustion gases are exhausted in a stream, said method comprising introducing said stream of gases at a first level to a preheater; introducing fine-grained material to said preheater in the path of said stream of gases, said material being introduced to said preheater at a second level above that at which said stream of gases in introduced to said preheater whereby said ,material may move gravitationally in a direction toward said first level; adding fuel to said material under non-combustion conditions; and subsequently combusting said fuel at a firing zone in said preheater located between said first and second levels s to preheat said material.

8. A method according to claim **5** wherein said material reaches said firing zone in annular form and wherein said fuel is added to said material while the latter is in said annular form.

3,910,755

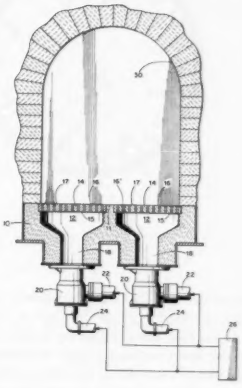
PARTICULATE MATERIAL HEATING APPARATUS AND METHOD

Andrew J. Syska, Marblehead, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Continuation of Ser. No. 399,675, Sept. 21, 1973, abandoned, which is a continuation of Ser. No. 273,955, July 21, 1972, abandoned. This application July 29, 1974, Ser. No. 492,368

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—14 **4 Claims**



1. In a process of treating finely ground material having an average particle size not in excess of 200 mesh (0.0029 inches) utilizing a bifurcated chamber divided by a perforated plate, an operating cycle which comprises the steps of:

firing combustion products upward through substantially uniformly distributed openings in said plate not substantially less than 0.125 inches across or substantially greater than 0.250 inches across having upper width dimensions at least as large as corresponding lower width dimensions, a ratio of opening length to opening width of at least 5 and providing at least 1 percent and not substantially in excess of 3 percent open area in said plate;

creating a substantially uniform pressure drop at all openings through said plate means during firing conditions, thereby producing substantially uniform jets of combustion products above said plate means;

introducing quantities of material to be treated into a treatment region above said plate means to form an overburden upon said plate means;

by means of said firing step, heat treating such material and at least partially fluidizing the same;

subsequent to the above said steps, shutting down said firing;

permitting said overburden to settle upon said plate; and

obstructing the downward passage through said plate means of said material to be treated during periods of non-firing by lodging action of said materials within said openings along the lengths thereof.

3,910,756

HEAT TREATING DRUM

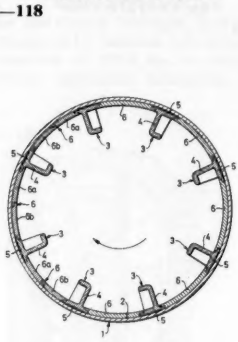
Kurt Henning, Neubeckum, Germany, assignor to Polysius AG, Neubeckum, Germany

Filed Nov. 2, 1973, Ser. No. 412,429

Claims priority, application Germany, Nov. 10, 1972, 2255069

Int. Cl.[2] F27B 7/14

U.S. Cl. 432—118 4 Claims



1. Apparatus for the heat treatment of erosive material comprising a rotary drum having a cylindrical wall and adapted to receive material to be treated; a plurality of wear plates on the inner surface of said wall and extending circumferentially about the wall to provide a liner; means for securing said wear plates to said wall, said wear plates being curved to conform substantially to the curvature of said wall and selected ones of said plates being spaced from one another at circumferentially spaced intervals; a plurality of uniform material lifting blades within said drum spaced circumferentially about said wall according to the spacing between said selected ones of said wear plates; and mounting means carried by each of said blades for mounting the latter on said wall, each of said mounting means comprising a foot occupying the space between said selected ones of said wear plates and having a planar surface confronting said wall, the wear plates on opposite sides of each space overlying the adjacent edge of the associated foot and clamping the latter against said wall, each of said lifting blades extending radially inwardly of said drum and having a radial length such that material lifted thereby in response to rotation of said drum falls in a haze.

3,910,757

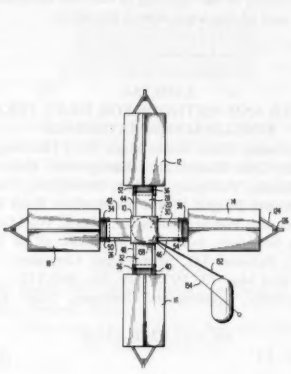
MOBILE TOBACCO CURING AND DRYING SYSTEM

Miller Taylor, Rt. 1, Box 118; Jimmy N. Taylor, Rt. 1, Box 107, and Oren M. Taylor, Rt. 1, Box 117A, all of Elizabethtown, N.J. 28337

Continuation of Ser. No. 389,087, Aug. 17, 1973. This application Aug. 30, 1974, Ser. No. 501,960

Int. Cl.[2] A24B 1/02

U.S. Cl. 432—500 5 Claims



1. A mobile drying apparatus comprising a central fan and heating means including a housing defining a vertically disposed plenum chamber having a plurality of return ducts connected to the top of said chamber and a plurality of supply ducts connected to the bottom of said chamber, portable barn means having a top, a bottom, side walls, a front end and a rear end, wheels mounted on said barn means and tow bar means connected to the front end of said portable barn means, said portable barn means having closable access means on said top and closable access means on said rear end thereof and means for connecting said return and supply ducts to said rear end of said portable barn means above and below said closable access means on said rear end for circulating hot air from said fan and heating means through said portable barn means and back to said fan and heating means.

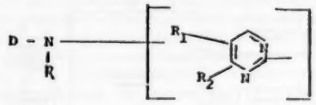
3,910,758

DYEING WOOL WITH FLUORINE SUBSTITUTED PYRIMIDINE CONTAINING AZO REACTIVE DYESTUFF

Hans-Samuel Bien, Burscheid, and Brich Klauke, Odenthal-Hahnenberg, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Continuation of Ser. No. 155,663, June 17, 1971, abandoned, which is a division of Ser. No. 664,943, Sept. 1, 1967, Pat. No. 3,669,951. This application Jan. 22, 1973, Ser. No. 325,700
Claims priority, application Germany, Sept. 10, 1966, 50181; Mar. 25, 1967, 51942
Int. Cl.[2] D06P *1/02*
U.S. Cl. 8—41 R 6 Claims

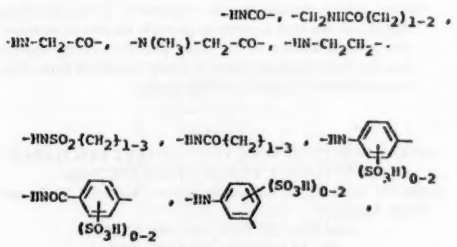
1. A process of dyeing wool in a dye bath at a pH in the acid to neutral range wherein the dyestuff is a reactive dyestuff of the formula:

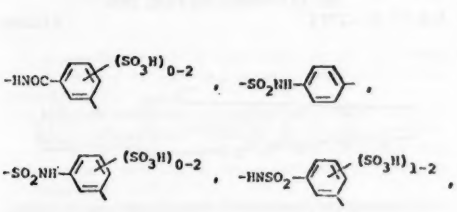


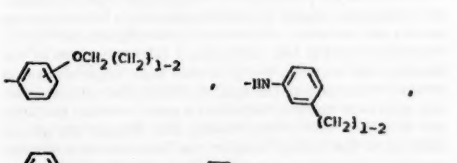
F

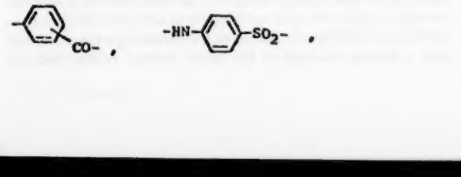
wherein D is the residue of a water soluble metal free azo dyestuff; the

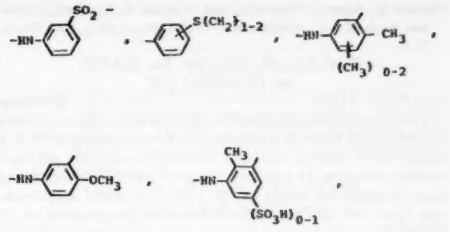
grouping being bonded directly to a carbon atom of the pyrimidine nucleus and to an aromatic carbocyclic carbon atom of D directly or via a bridge member selected from the group consisting of lower alkylene, $-SO_2-$

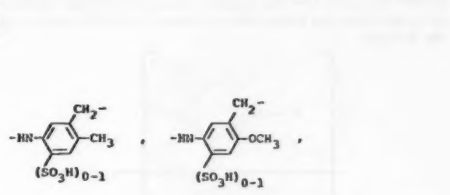


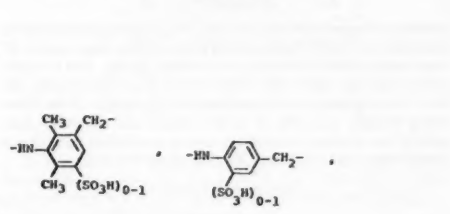


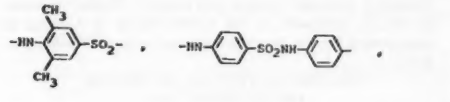


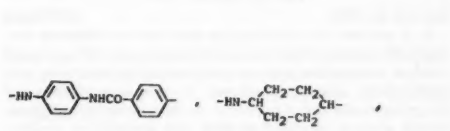


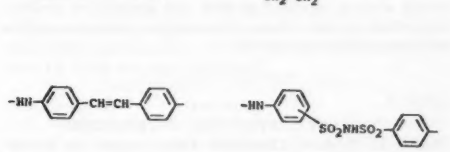


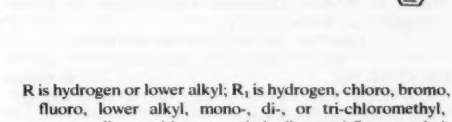












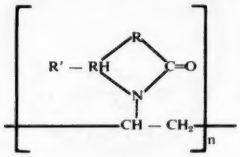
R is hydrogen or lower alkyl; R_1 is hydrogen, chloro, bromo, fluoro, lower alkyl, mono-, di-, or tri-chloromethyl, mono-, di- or tri-bromomethyl, di- or tri-fluoromethyl, vinyl, allyl, nitro, cyano, carbo lower alkoxy, or lower alkyl sulfonyl; R_2 is hydrogen, chloro, bromo, fluoro, lower alkyl, mono-, di-, or tri-chloromethyl, mono-, di- or tri-bromomethyl, di- or tri-fluoromethyl, carbo lower alkoxy, lower alkyl sulfonyl, or p-chlorophenylsulfonyl; and F is fluoro.

3,910,759
METHOD OF TREATING FABRICS

Derwin K. Sthare, Charlotte, and William T. Ledford, Gastonia, both of N.C., assignors to GAF Corporation, New York, N.Y.

Filed Aug. 25, 1972, Ser. No. 283,744
Int. Cl. D06m *15/52*
U.S. Cl. 8—115.7 **8 Claims**

1. A process comprising treating textile materials containing thermoplastic fibers at a temperature between about 50°F and about 125°F with an aqueous emulsion containing approximately by weight (I) 5 to 15% of a graft copolymer containing approximately by weight 0.1 to 10% N-methylol acrylamide and 50 to 70% of C_{1-6} alkyl acrylate graft polymerized on 20 to 40% of a poly (N-vinyl lactam) having an average molecular weight between about 400 and about 2,000,000 and having the formula



wherein R represents an alkylene bridge group necessary to complete a 5, 6 or 7-membered heterocyclic ring system, R′ represents either hydrogen or a methyl group, and n represents a number indicative of the extent of polymerization (II) 0 to 5% of a cationic softener based on the weight of the fibers being treated, and (III) 95 to 80% water; and thereafter subjecting the treated materials to curing conditions including a temperature of from about 250° to about 350°F.

3,910,760
AZEOTROPIC SOLVENTS FOR PERMANENT PRESS TREATMENTS OF COTTON AND COTTON BLEND FABRICS

Ralph J. Berni, Metairie; Ruth R. Benerito, New Orleans; Elwood J. Gonzales, Gretna, and Linda L. Muller, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 14, 1973, Ser. No. 360,281
Int. Cl.² D06M *13/34*
U.S. Cl. 8—186 **24 Claims**

1. A process for improving the treatment of cellulosic textiles with N-methylolated ureas in the presence of Lewis acid catalyst wherein the improvement consists of dissolving said methylolated ureas in azeotropes of water and a member of the group consisting of isopropyl alcohol, methylethyl ketone, t-butyl alcohol, n-propyl alcohol, and dioxane, to produce nitrogen-containing chemically modified cellulosic textiles and a recyclable reagent bath.

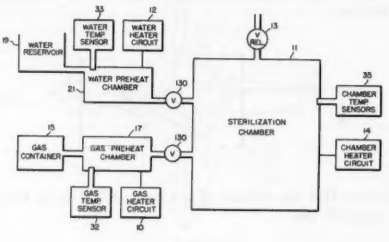
3,910,761
CONTROL SYSTEM FOR A STERILIZER

Charles L. Hopkins, Cincinnati, Ohio, assignor to Sybron Corporation, Rochester, N.Y.

Filed Nov. 28, 1973, Ser. No. 419,567
Int. Cl.² A61L *3/00, 3/02, 13/04*
U.S. Cl. 21—93 **19 Claims**

1. A control system for a sterilizer, said sterilizer having
a. a sterilizing chamber;
b. means for inserting a plurality of fluids into said sterilizing chamber;
c. a plurality of fluid control units for controlling said inserting means; and
d. means for preheating to a predetermined degree said sterilizing chamber and said fluids, prior to insertion of said fluids into said sterilizing chamber;

said control system comprising:
sequence enable circuit means responsive to the completion of the preheating of said chamber and of said plurality of fluids to provide an enabling signal upon the attainment of said predetermined degree;
first timing circuit means connected to said fluid control units and responsive to said enabling signal, for activating said plurality of fluid control units in a preset sequence for the insertion of said plurality of fluids into said sterilizing chamber at preset timed intervals;
chamber temperature sensing means;
over temperature detection circuit means connected to said chamber temperature sensing means for providing an abort signal when the sterilizing chamber temperature exceeds a preset temperature limit;

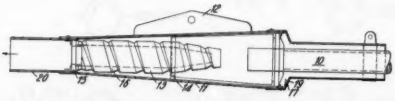


under temperature detection circuit means connected to said chamber temperature sensing means responsive to said enabling signal for providing an abort signal when the sterilizing chamber temperature drops below a preset temperature limit;
abort circuit means connected to both said over and under temperature detection circuit means for shutting off the control system in response to an abort signal; and
second timing circuit means, responsive to the enabling signal and enabled thereby to provide an end of sterilizatin cycle indication in the event that the control system has not been shut-off within a preset period of time after the generation of said enabling signal.

3,910,762
MEANS FOR PURIFYING THE EXHAUST DISCHARGE OF INTERNAL COMBUSTION ENGINES

James W. Morrall, 16 Ashendene Grove, Hanford, Stoke-on-Trent, England

Filed Jan. 15, 1973, Ser. No. 323,559
Int. Cl.² F01N *3/10;* **F23G** *7/06*
U.S. Cl. 23—277 C **8 Claims**



1. A device for purifying the exhaust discharge of an internal combustion engine, the device including a housing having an inlet and an outlet, a hollow heat-retaining member located within the housing and occupying a substantial part of the housing, said member being formed from unglazed porous ceramic material and arranged such that the exhaust gases may pass over its outer surface in a space between the latter and the inner wall of the housing and through the porous material to the hollow interior, the heat-retaining member having an end portion of tapering cross-section with its narrow end closed and directed towards the incoming exhaust stream and a helical channel in the outer surface of the member

serving to guide the gases around the surface and thereby increase the length of their path of contact with the member, the heat generated within the device being derived solely from the exhaust gases, and means for admitting air into the exhaust stream upstream of the heat-retaining member.

3,910,763

METHOD OF DETECTING ORGANOPHOSPHORUS AGENTS USING 1-PHENYL-1,2,3-BUTANETRIONE-2-OXIME AND CYANIDE INDICATING COMPOSITION

Edward J. Poziomek, Bel Air; Eleanor V. Crabtree, Towson, and David N. Kramer, Stevenson, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1969, Ser. No. 868,663
Int. Cl.[2] G01N *31/22*
U.S. Cl. 23—232 R **4 Claims**

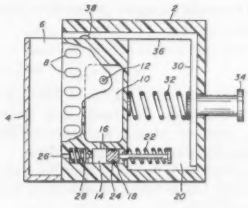
1. A detection method comprising the steps of contacting organophosphorus chemical warfare agents with a detecting matrix including an inert absorbent, an autocatalytic detector of 1-phenyl-1,2,3-butanetrione 2-oxime, and signaling composition of a mixture comprising o-dinitrobenzene and p-nitrobenzaldehyde, the matrix and its contents producing cyanide ions and indicating the presence of the warfare agents, a portion of said cyanide ions react with said autocatalytic detector producing additional cyanide ions and remaining portion of said cyanide ions react with said signaling composition producing a color signal with regeneration of said remaining portion of cyanide ions.

3,910,764

WATER TESTING DEVICE

Ronald H. Tower, 1340 Royal Drive, Library, Pa. 15129

Filed Dec. 23, 1974, Ser. No. 535,202
Int. Cl.[2] G01N *1/12, 21/06, 31/22, 33/18*
U.S. Cl. 23—253 R **7 Claims**



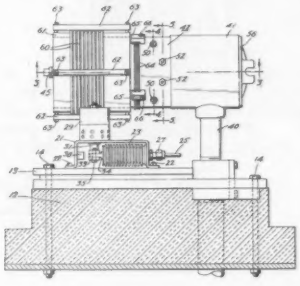
1. A portable, hand-held water testing device, comprising:
a body, having at least one reagent measuring chamber formed therein;
at least one water sample chamber attached to the body, each water sample chamber having an open upper end and a closed lower end, one water sample chamber being associated with and in communication with a reagent measuring chamber;
at least one reagent reservoir, one reagent reservoir being associated with and in communication with each reagent measuring chamber;
a plunger, mounted to the body and having at least one movable gate connected thereto, the number of gates corresponding to the number of water sample chambers, said plunger being movable between a closed position wherein a gate seals the open end of each water sample chamber, and a rest position wherein said water sample chamber remains open;
biasing means which urge the plunger toward the rest position; and
means operated by the plunger for forcing a predetermined amount of reagent from the reagent measuring chamber into the water sample chamber when the open end of the water sample chamber is sealed.

3,910,765

PROCESS GAS CHROMATOGRAPH ANALYZER

Robert L. Tinklepaugh, Malvern; John D. Walters, Broomall; Charles Bross, Jr., Swarthmore, and Kenneth Lownes, Glen Mills, all of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Dec. 2, 1974, Ser. No. 528,755
Int. Cl.[2] G01N *27/18, 31/08*
U.S. Cl. 23—254 E **6 Claims**



1. In a gas chromatography apparatus, a means for achieving more accurate test data by reducing temperature variations within the chromatograph components, comprising:
a. an insulated container,
b. an essentially solid heating block, having a plurality of internal passages and mounted inside the insulated container,
c. a plurality of detector filaments embedded in the heating block, said internal passages providing fluid communication from the exterior of the heating block to the detector filaments,
d. heating means embedded in the heating block, and
e. tubing wound around the circumference of the heating block for use as column separators.

3,910,766

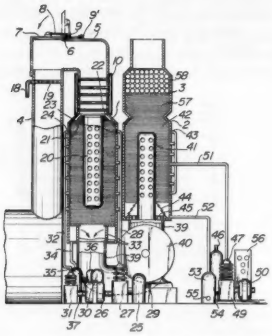
APPARATUS FOR REMOVING NOXIOUS SUBSTANCES FROM CHIMNEY EXHAUST GAS

Kiichi Yamada, No. 15-12, 1-Chome, Jingumae, Shibuya-Ku, Tokyo, Japan

Filed Apr. 24, 1973, Ser. No. 354,073
Claims priority, application Japan, Oct. 6, 1972, 47-100493The portion of the term of this patent subsequent to Dec. 18, 1990, has been disclaimed.
Int. Cl.[2] B01D *47/06;* **B01J** *10/00*
U.S. Cl. 23—260 **5 Claims**

1. An apparatus for removing noxious substances from chimney exhaust gas, comprising a first filtering chamber having an outlet and an inlet, said inlet communicating with the top end of the chimney through a bent duct and having spongy filtering members stuffed therein to assist in the removal of dust particles in the exhaust gas, a cooling means mounted on one end of the bent duct near to the inlet of the first filtering chamber, a first gas distributing tube having a plurality of perforations and extending downwardly from the inlet of the first filtering chamber toward the outlet thereof, a means for impregnating a liquid dust-absorbing agent in the spongy filtering members in the first filtering chamber, a means for spraying a washing liquid on the spongy filtering members in the first filtering chamber, a second filtering chamber having an outlet and an inlet, said inlet of the second

filtering chamber communicating with the outlet of the first filtering chamber through a duct provided with a motor-driven blower, said second filtering chamber having spongy filtering members stuffed therein to assist in the removal of sulfurous acid gas and other noxious substances in the exhaust gas, a second gas distributing tube having a plurality of perforations and extending upwardly from the inlet of the second filtering chamber toward the outlet thereof, a means for causing circulation of caustic soda solution through the spongy filtering members in the second filtering chamber so as to absorb sulfurous acid gas and other noxious substances in the exhaust gas, and a third filtering chamber mounted at the outlet of the second filtering chamber and carrying spongy filtering members and activated charcoal therein to assist in the removal of any residual noxious substances in the exhaust gas, said third filtering chamber having an outlet for treated gas.



3,910,767

APPARATUS FOR PREPARING METALLIC COMPOUNDS BY SUBLIMATION

Emile Joseph Jemal, 67 Davenport Road, Yonkers, N.Y. 10522

Continuation-in-part of Ser. No. 269,064, July 5, 1972, Pat. No. 3,848,050. This application Aug. 10, 1973, Ser. No. 387,308

Int. Cl. B01d *7/00;* **B01j** *17/32*

U.S. Cl. 23—264 **11 Claims**

1. Apparatus for the sublimation of sublimable ore concentrates which comprises:

a. at least one corrosion-resistant, heat-resistant reaction chamber having a substantially rectilinear lower section and a curved upper section;

b. a corrosion-resistant, heat resistant vessel in said lower section for carrying sublimable ore concentrates in said reaction chamber, said vessel terminating into a substantially cup-shaped configuration;

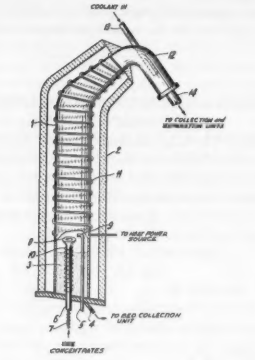
c. means for feeding the ore concentrates to said cup-shaped vessel;

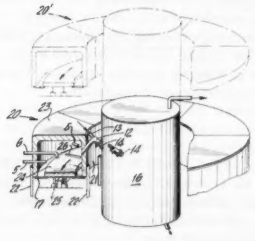
d. means for continuously introducing an oxidizing gaseous stream to a region in the reaction chamber proximate said cup-shaped vessel;

e. heating means surrounding at least said rectilinear lower section of said reaction chamber, externally thereto, to obtain oxidation-sublimation conditions within said reaction chamber;

f. means for introducing into said upper section a coolant medium for condensing the condensable constituent products of the oxidation-sublimation reaction;

g. means for withdrawing from the rectilinear section of the reaction chamber those constituents of the feed which are not sublimable; and





h. means for collecting and separating the products of the reaction.

3,910,768

HIGH PRESSURE CRACKING FURNACE AND SYSTEM

Herman N. Woebcke, Wayland, and Robert J. Gartside, Brighton, both of Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Nov. 6, 1973, Ser. No. 413,333

Int. Cl.[2] C07C *11/02;* **B01J** *1/14;* **C10G** *9/20*

U.S. Cl. 23—277 R **8 Claims**

1. A furnace for thermally cracking hydrocarbons, comprising:

a. a convection section for operation with flue gas at a pressure of about 5 to about 15 atmospheres;

b. a radiant section for operation with flue gas at a pressure of about 5 to about 15 atmospheres;

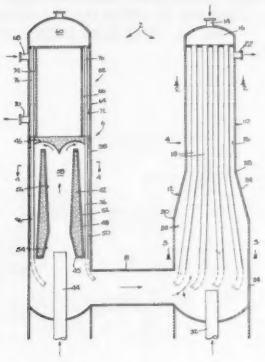
c. a cross-over section in communication with the convection section and the radiant section;

d. process tubes which extend from the inlet at one end of the convection section through the convection section, the cross-over section and through the radiant section;

e. at least one long flame burner located in the radiant section;

f. a chimney shaped member disposed in the radiant section, the outer wall of the chimney shaped member converging toward one end thereof defining with the radiant section inner wall an annular chamber for said radiant section process tubes, said annular chamber having a varying cross-sectional area which decreases toward said long flame burner, and the inner wall of the chimney shaped member defining a central passage for combustion gas,

the central passage being shaped to direct the combustion gas therethrough; and



g. means for directing the combustion gas exiting from the central passage of the chimney into said annular chamber of varying cross-sectional area from which it flows into said cross-over section and said convection section.

3,910,769

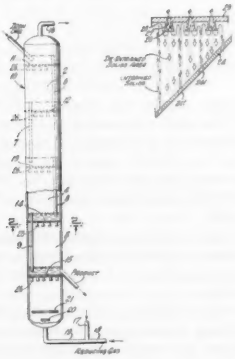
APPARATUS FOR FLUIDIZED SOLID SYSTEMS

Ivan Mayer, Summit, N.J., and Maurice A. Bergougnou, London, Canada, assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 312,720, Dec. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 81,540, Oct. 16, 1972, abandoned, which is a continuation of Ser. No. 778,025, Nov. 20, 1968, abandoned, which is a continuation of Ser. No. 573,225, Aug. 18, 1966, abandoned. This application Dec. 11, 1973, Ser. No. 423,696

Int. Cl.[2] C22B *1/10;* **B01J** *8/44*

U.S. Cl. 23—284 **15 Claims**



1. An apparatus for use in fluidized solid system comprising:

a vessel defining a flow path for said fluidized solids;

means for introducing and means for removing said solids;

means for introducing and means for removing fluidizing gases;

a plate horizontally located across the enclosing walls of said vessel thereby forming a boundary for a fluidized solids bed, said plate containing a plurality of apertures therethrough;

nozzles for each aperture in said plate having an outlet on the upper surface of said plate formed from walls surrounding said apertures, said nozzles extending downwardly below the lower face of said plate, said downwardly extending nozzles having walls diverging at an angle not greater than 30° as measured from the vertical axis of said nozzle, whereby a smooth flow path is provided so that most of the solids will flow upwardly near the vertical axis of said nozzles andd thereby avoid sticking and fouling of the grid.

3,910,770

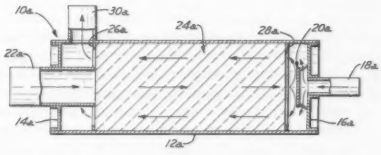
CATALYTIC CONVERTER

Tadeusz P. Kobylinksi, Cheswick Township, Allegheny County, and Brian W. Taylor, Richland Township, Allegheny County, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 23, 1971, Ser. No. 211,479

Int. Cl.[2] F01N *3/15*

U.S. Cl. 23—288 FB **5 Claims**



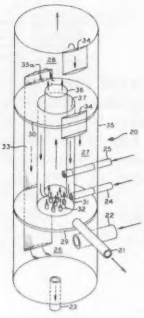
1. A two-stage catalytic converter for treating internal combustion engine exhaust gases comprising a converter body, a single monolithic corrugated ceramic catalyst carrier formed with a relatively large number of relatively small individual passages extending longitudinally therethrough, means to mount said carrier with said body to substantially fill the space within said body, a reduction catalyst coated onto the walls of a first portion of said passages in said carrier to thereby define a reduction catalyst bed in said carrier, an oxidation catalyst coated on the walls of a second portion of said passages in said carrier to thereby define an oxidation catalyst bed in said carrier, said first and second portions of said passages being so located that said reduction bed is nested within said oxidation bed, means to admit exhaust gases to be treated into said converter body at a first location therein and into the ends of the passages of said reduction bed in said carrier associated with said first location; and means to admit air under pressure into said converter body at a second location therein, and to mix said air under pressure with said exhaust gases after said exhaust gases have exited from the passages of said reduction bed at said second location, and to admit the mixture of said air and the partially treated exhaust gases into the ends of the passages of said oxidation bed in said carrier associated with said second location.

DAM/RDK

3,910,771
APPARATUS FOR CONTACTING HF ALKYLATE CONTAINING ALKYL FLUORIDE WITH ADDITIONAL HF CATALYST TO CONVERT ALKYL FLUORIDE TO ADDITIONAL ALKYLATE

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 139,017, April 30, 1971. This application May 30, 1973, Ser. No. 365,321
Int. Cl.[2] B01J 8/00, 10/00; C07C 3/54
U.S. Cl. 23—288 E 4 Claims



1. An apparatus for treating an alkylate produced from an isoparaffin-olefin alkylation in presence of hydrogen fluoride as an acid catalyst to remove alkyl fluoride therefrom and to produce additional alkylate which comprises:

a vessel defined by a top, a bottom, and sidewalls, said vessel being divided into three sections, the lower section having its upper end determined by a first partition, the midsection and the upper section being divided by an apertured partition,

a first conduit extending upwardly from the top of the first partition to the bottom of the apertured partition, being in substantial register with the aperture, and being in sealing engagement with both partitions,

a riser-reactor conduit located within said first conduit and extending upwardly from a level just above said first partition and extending into the upper section of the vessel to a level just above the top of the apertured partition,

an inlet for passing alkylate and acid catalyst to be treated into the lower section of the vessel,

nozzle means disposed in the first partition over a substantial area, but not all of the area of the partition, said nozzle means being encompassed by the first conduit and positioned such that fluids from the lower section passing through the nozzles are directed into the riser-reactor conduit,

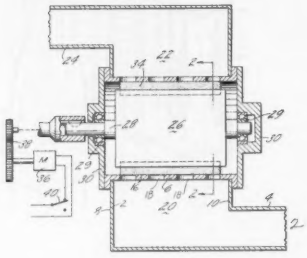
an acid downcomer means providing communication between the bottom of the upper section of the vessel and lower section of the vessel, said downcomer means having its uppermost portion at a level above the apertured partition, but below the upper end of the riser-reactor conduit and extending into the lower section of the vessel a sufficient distance below the nozzle means to insure that the head of liquid in the downcomer is great enough to permit the liquid to flow into the lower section when it is pressurized by the alkylate admitted through the inlet, and

a means for removing hydrocarbon from the upper section of the vessel.

3,910,772
APPARATUS FOR REACTIVATING CATALYST SURFACES IN AN EXHAUST SYSTEM

Francis J. Fennessy, East Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 22, 1974, Ser. No. 435,610
Int. Cl.[2] B01J 8/00; F01N 3/15
U.S. Cl. 23—288 F 3 Claims



1. A catalytic reactor for purifying exhaust gas comprising:

a chamber having an inlet for exhaust gas at one end thereof and an outlet for purified exhaust gas at the opposite end thereof,

a cylinder transversely positioned in said chamber relative to the flow path of exhaust gas through said chamber, said cylinder being tangent to and contacting opposite sidewalls of said chamber and being perforated for transverse flow of exhaust gas therethrough and having a catalytic coating on its inner surface,

abrasive means in the form of abrasive blocks positioned within and extending lengthwise of the cylinder and in contact with the inner surface thereof,

means movably mounting said abrasive means within said cylinder and

means for intermittently actuating said mounting means to abrade and reactivate the catalytic coating on said cylinder.

3,910,773
BENEFICIATION OF SALTS CRYSTALLIZED FROM SEARLES LAKE BRINE

Donald E. Garrett, Claremont; Mauritz J. Kallerud, Upland, and Elie M. Chemtob, Claremont, all of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Division of Ser. No. 25,814, April 6, 1970, abandoned. This application Oct. 10, 1972, Ser. No. 295,847
Int. Cl.[2] B01D 9/02; C01D 3/06, 3/08; C01B 35/00
U.S. Cl. 23—297 7 Claims

7. A process for treating a grouping of crystalline salts from the crystallization of a Searles Lake Brine containing the ions sodium, potassium, chloride, sulfate, carbonate and borate which comprises:

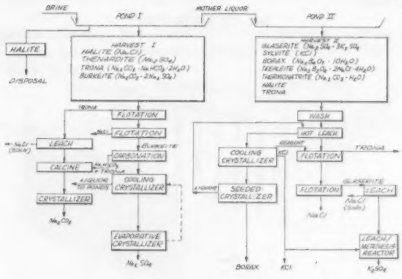
a. leaching sylvite and borax from the crystalline salt grouping comprising sylvite, glaserite, borax, trona, teepleite, thermonatrite and halite using a hot leach solution;

b. cooling the hot leach liquor to crystallize sylvite and form a liquor rich in borax;

c. seeding the liquor rich in borax with borax to crystallize borax and form a residual liquor; and

d. reheating at least part of the residual liquor from borax crystallization to leach additional sylvite and borax from the crystalline salt grouping;

e. beneficiating the residual salts of the crystalline grouping to obtain a float containing predominately glaserite using as the flotation reagent a compound selected from the group consisting of saturated fatty acids, unsaturated fatty acids, salts of saturated fatty acids, salts of unsaturated fatty acids, sulfonated hydrocarbons, hydrocarbon sulfates and mixtures thereof;



f. converting the glaserite to potassium sulfate by reaction with sylvite, and

g. beneficiating the residual salts from step (*e*) to obtain a float containing predominately trona, using as the beneficiating reagent cresylic acid.

3,910,774
SOLID FILM LUBRICANT AND METHOD FOR LUBRICATING CYCLING LOW-HIGH TEMPERATURE FRICTION SURFACES

Robert D. Krienke, Waco; Johnny W. Head, Fort Worth; Harold C. Hoffman, Fort Worth, and Earl W. Turns, Fort Worth, all of Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Continuation-in-part of Ser. No. 63,637, Aug. 13, 1970, abandoned, which is a continuation-in-part of Ser. No. 812,947, March 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 537,256, March 16, 1966, abandoned. This application Jan. 24, 1973, Ser. No. 326,406

Int. Cl.[2] **B23P** *3/00*; **C25D** *3/48*, *3/62*

U.S. Cl. 29—183.5 **10 Claims**

1. A method for lubricating surfaces movable relative to one another by providing on at least one such surface a porous, malleable, soft but coherent solid lubricant of metal and metal oxide comprising:

A. cleaning at least one of said surfaces,

B. depositing thereon a solid film lubricant essentially comprised of a matrix of gold with a refractory metal and at least one oxide thereof from an aqueous solution of potassium gold cyanide consisting in essence of:

1. from 5 to 15 grams per liter potassium gold cyanide,
2. an ionizable molybdenum compound in an amount between 5 and 60 grams per liter for providing a substantial plateout of molybdenum in oxide form in said lubricant,
3. at least one non-reducible conducting salt of from about 5 to 150 grams per liter of solution,

C. maintaining the temperature of the solution at from 140° to 160°F, and,

D. closely controlling the plating solution voltage versus a saturated calomel electrode at from about 1.4 volts to 2.0 volts,

the solution and deposition being controlled to deposit a solid film lubricant having a concentration of molybdenum oxide therein in an amount of about 2% to 50% by weight of said deposited film, the remainder being essentially gold.

7. An article made in accordance with claim **1.**

8. The article of claim 7 in which the solid lubricant has a deposited thickness in the range from about 0.0002 **to about** 0.001 inches.

3,910,775
METHOD AND APPARATUS FOR PROCESSING REFUSE, SEWAGE AND/OR WASTE MATERIAL INTO A SOURCE OF ENERGY

Victor Jackman, North Huntingdon, Pa., assignor to John M. Fox; John V. McKeever; Harry F. Ferguson and John B. Sotak, all of North Huntingdon, Pa., part interest to each

Filed Feb. 22, 1974, Ser. No. 444,787

Int. Cl.[2] **B30B** *11/00*; **C10L** *5/22*; **F23G** *5/00*

U.S. Cl. 44—13 **32 Claims**

32. A system comprising, means for receiving collected heterogeneous refuse, means for separating ferromagnetic objects from the collected heterogeneous refuse, means for shredding the collected heterogeneous refuse, means for adding waste to the shredded refuse, means for compressing, dewatering and briquetting the waste and shredded refuse, means for feeding the briquetted waste and refuse to filtration means wherein the briquetted waste and refuse form a filter bed, means for passing raw sewage through the filter bed wherein solids, matter in suspension and precipitates are filtered from the incoming raw sewage by the filter briquettes, means for removing expended filter briquettes from the filter bed, means for dewatering and pelletizing the expended filter briquettes, means for mixing waste with the pellets, and means for compressing, dewatering and briquetting and mixture of waste and pellets to form high stable fuel briquettes.

3,910,776
ADDITIVE COMBINATION FOR COLD FLOW IMPROVEMENT OF DISTILLATE FUEL OIL

Nicholas Feldman, Woodbridge, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 283,548, Aug. 24, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 496,004

Int. Cl.[2] **C10L** *1/22*

U.S. Cl. 44—62 **11 Claims**

1. A fuel oil improved in its cold flow characteristics comprising a major proportion of an atmospheric distillate petroleum fuel oil, and a flow improving combination of:

A. wax-aromatic lubricating oil pour point depressant which is the Friedel-Crafts condensation product of wax having a melting point of about 100° to 200°F. chlorinated to about 5 to 25 wt. percent chlorine and condensed with an aromatic in a relative weight ratio of about 5 to 15 parts of chlorinated wax per part of said aromatic, and a middle distillate fuel oil pour depressant selected from the group consisting of:

B. an ethylene backbone pour point depressant of about 500 to 50,000 number average molecular weight selected from the group consisting of:

1. branched polyethylene,
2. ethylene polymer chlorinated to contain about 5 to 35 wt. percent chlorine,
3. copolymers of 3 to 40 molar proportions of ethylene with a C_3 to C_{16} alpha monoolefin, or a monoethylenically unsaturated mono- or dialkyl ester having about 1 to 16 carbon atoms in said alkyl groups, and

C. succinamic acid composition of the formula

$$R - \underset{\displaystyle CH_2 - COX_3}{\overset{\displaystyle |}{CH}} - COX_2$$

wherein R is a straight chain aliphatic hydrocarbon having from 0 to 1 sites of olefinic unsaturation from 14 to 40 carbon atoms and attached at a secondary carbon atom to the succinyl group; one of X^2 and X^3 is —NYY^1, wherein Y and Y^1 are aliphatic hydrocarbyl groups of from 14 to 28 carbon atoms, the other of X^2 and X^3 is of the formula:

$$—OH(NHY^2Y^3)n$$

wherein *n* varies from 0 to 1, Y^2 and Y^3 are hydrogen, aliphatic hydrocarbon of from 1 to 30 carbon atoms or oxyaliphatic hydrocarbon of from 1 to 30 carbon atoms, and may be taken together with the nitrogen to which they are attached to form a heterocyclic ring of from 5 to 7 annular members.

3,910,777

ABSORPTION SYSTEM FOR SEPARATE RECOVERY OF CARBON DIOXIDE AND HYDROGEN SULFIDE IMPURITIES

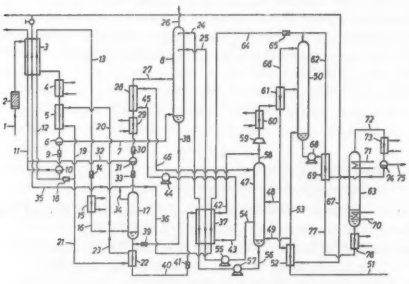
Fritz Jakob, Achmuhle, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Dec. 18, 1973, Ser. No. 425,862

Claims priority, application Germany, Dec. 20, 1972, 2262457

Int. Cl.² B01D *53/14*

U.S. Cl. 55—48 **10 Claims**



1. In a gas purification process comprising in a first scrubbing column, scrubbing out gaseous impurities comprising carbon dioxide and hydrogen sulfide from gases with an organic polar solvent scrubbing agent, said process being conducted under superatmospheric pressure and at a low temperature, and expanding resultant loaded scrubbing agent to liberate a portion of the components dissolved therein, the improvement wherein after the expansion of the loaded solvent, the resultant expanded solvent is stripped with a H_2S-removing stripping gas obtained from outside the process to remove the hydrogen sulfide from said resultant expanded solvent, recycling the stripped-out scrubbing agent without further regeneration to said first scrubbing column, scrubbing the resultant loaded stripping gas containing the hydrogen sulfide with thermally completely regenerated scrubbing agent in a second scrubbing column separate and distinct from said first scrubbing column to remove the hydrogen sulfide therefrom, and thermally and completely regenerating the resultant loaded scrubbing agent to form said thermally and completely regenerated scrubbing agent.

3,910,778

BIOLOGICAL FILTER FOR THE STERILIZATION AND ENRICHMENT OF A GAS STREAM WITH NEGATIVE IONS

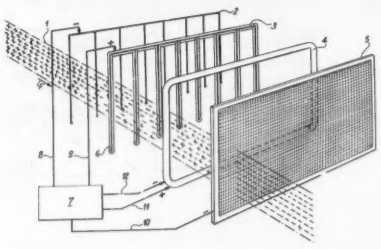
Manouchehr Shahgholi, 87 N. Pahlavi Ave., and Ali Sekhavat, Boite Postale 837, both of Teheran, Iran

Filed Sept. 27, 1973, Ser. No. 401,156

Claims priority, application France, Oct. 23, 1972, 72.37540

Int. Cl. B03c *3/00*

U.S. Cl. 55—102 **1 Claim**



1. A biological filter for the sterilization and enrichment of a gas stream with negative ions, comprising on the path of the gas molecules and in the direction of flow of the gas, a first separating electrode at a negative potential −V, a second extraction electrode at a positive potential +V and entirely covered with electric insulating material, an ultraviolet lamp for irradiating said gas stream, a third output electrode at a negative potential −V, the three electrodes being conductive metallic grids, the second electrode being electrically insulated from the gas stream by a covering of plastic material, the ultraviolet lamp surrounding the gas stream and the value 2V being between 350 and 400 volts.

3,910,779

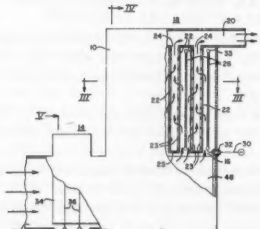
ELECTROSTATIC DUST FILTER

Gaylord W. Penney, 216 Paris Road, Pittsburgh, Pa. 15235

Filed July 23, 1973, Ser. No. 381,781

Int. Cl.² B03C *3/01*

U.S. Cl. 55—124 **14 Claims**



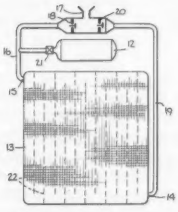
1. An electrostatic filter for collecting electrically charged particles in a porous layer, said filter comprising a porous filter member having a surface extending across the path of movement of said particles, said filter member including a grounded metal support and a fabric filtering element disposed directly

on said support, means for maintaining a substantially constant, unidirectional electric field at said surface in a direction generally perpendicular to the surface and of polarity to drive said particles toward the surface, and means for maintaining the strength of the electric field such that no corona can occur.

3,910,780
SEPARATIVE BARRIER FOR PREFERENTIAL TRANSPORT OF CO_2 AND APPARATUS EMPLOYING SAME

Julian L. Henley, New York, N.Y., and Sanlu Y. Chang, Lexington, Mass., assignors to Hydro-membronics, Inc., New York, N.Y.

Filed June 14, 1973, Ser. No. 370,154
Int. Cl.² B01D *13/00, 53/22*
U.S. Cl. 55—158 **19 Claims**



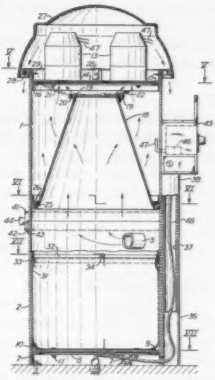
1. A separative barrier for the preferential separation under water of CO_2 from a mixture of CO_2 and other gases, comprising a porous structural matrix for confining said mixture under water with active preferential transport of CO_2 through said matrix to said water, said matrix including a membranous element which is at the same time porous, hydrophobic, impregnated with an hydration catalyst for hydration of CO_2 and exposed on opposite sides for direct contact with said water and said mixture, respectively.

3,910,781
VERTICAL-TANK-TYPE VACUUM CLEANER

Samuel Bryant, Jr., P.O. Box 334, Zelienople, Pa. 16063

Filed Oct. 22, 1974, Ser. No. 516,992
Int. Cl.² B01D *41/00*
U.S. Cl. 55—305 BN **11 Claims**

1. A vacuum cleaner comprising a tank having superimposed separate top and bottom sections and provided in its side with an air inlet for connection to a flexible hose, electrically operated suction means at the top of the tank for drawing air in through said inlet and discharging it at the top of the tank, a filter mounted in said top section in the path of air flowing from said inlet to said suction means and having an upstream surface and an opposite downstream surface, means in said bottom section for removably holding an open-top collection bag therein beneath said filter in a position to receive dirt from the upstream surface of the filter, and vertical pivot means secured to the side of the tank to permit its top section to be swung laterally to uncover its bottom section,

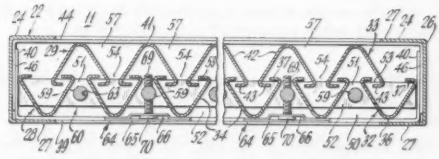


whereby a dirt-filled collection bag can be lifted out of said bottom section.

3,910,782
BAFFLE TYPE GREASE FILTER

Robert W. Struble, Yardley, Pa., and John T. Eckstine, Eatontown, N.J., assignors to Buildex Incorporated, Jericho, N.Y.

Filed Sept. 27, 1973, Ser. No. 401,318
Int. Cl.² B01D *45/00*
U.S. Cl. 55—444 **10 Claims**



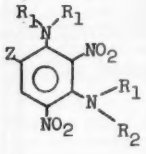
1. A filter device for removing grease entrained in an air stream comprising a plurality of laterally spaced longitudinally extending pairs of laterally spaced first baffle panels (**34**), the baffle panels of each pair converging in a predetermined forward direction and delineating inlet passages (**52**) having enlarged rear inlet openings (**50**) and reduced outlet throats (**51**), the panel (**34**) of each inlet passage (**52**) having relatively outwardly laterally projecting first flanges (**37**) and a plurality of laterally spaced longitudinally extending pairs of laterally spaced second baffle panels (**42**), the second baffle panels of respective pairs diverging forwardly and delineating outlet passages (**54**) having rear inlet openings disposed laterally between said inlet passages (**52**) and forward outlets (**57**), and the adjacent converging second panels (**42**) of adjacent pairs of second panels being connected along their forward edges, said second panels (**42**) of each outlet passage having laterally outwardly projecting second flanges (**43**) spaced rearwardly of said first flanges, said first flanges (**37**) having free edges laterally spaced from corresponding second panels (**42**) to form respective first openings and said second flanges (**43**) having free edges laterally spaced from corresponding first panels (**34**) to form respective second openings laterally and rearwardly offset from said first openings whereby corresponding pairs of proximate first and second openings delineate sinuous intermediate passages interconnecting said inlet and outlet passages.

3,910,783
DINITRO-1,3-P

Don L. Hunter, Anaheim; William G. Woods, Fullerton; James D. Stone, Whittier, all of Calif., and Cecil W. LeFevre, Franklin, Idaho, assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Nov. 2, 1970, Ser. No. 86,386The portion of the term of this patent subsequent to Nov. 2, 1988, has been disclaimed.
Int. Cl.[2] A01N *9/20*
U.S. Cl. 71—105 **8 Claims**

1. The method for controlling weed growth which comprises applying to the locus of said weeds a phytotoxic amount of a compound of the formula



in which Z is cyano, each R_1 is selected from the group consisting of hydrogen, lower alkyl, and lower alkenyl, and R_2 is selected from the group consisting of lower alkyl and lower alkenyl, said lower alkyl and lower alkenyl groups having up to about 6 carbon atoms.

3,910,784
PROCESS FOR THE PREPARATION OF A RAW MATERIAL SUITABLE FOR IRON PRODUCTION

Jussi Rastas, Pori, Finland, assignor to Outokumpu Oy, Outokumpu, Finland

Filed Jan. 28, 1974, Ser. No. 437,518
Claims priority, application Finland, Feb. 1, 1973, 294/73
Int. Cl.[2] C22B *1/00*
U.S. Cl. 75—1 **13 Claims**

12. The process of claim **1**, in which the slurry to be treated has a solid material content of about 200–500 g/l.

3,910,785
METHOD OF PREPARING A METAL POWDER MAINLY CONSISTING OF IRON

Peter Townsend Greene, Salfords, near Redhill, England; Hans Rau, Laurensberg, and Joachim Rolf Wegener, Oberforstbach, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 1, 1974, Ser. No. 465,903
Claims priority, application Netherlands, May 3, 1973, 7306143
Int. Cl.[2] H01F *1/30*
U.S. Cl. 75—5 BA **4 Claims**

1. A method of preparing a metal powder mainly consisting of iron by reduction of finely divided acicular iron oxide or iron oxide hydrate with a gaseous reduction agent, characterized in that the iron oxide particles or the iron oxide hydrate particles contain at least 0.1 at.% and at most 10 at.% of titanium relates to the iron.

3,910,786
HIGH TEMPERATURE DIRECT REDUCTION PROCESS FOR IRON ORE AGGLOMERATES

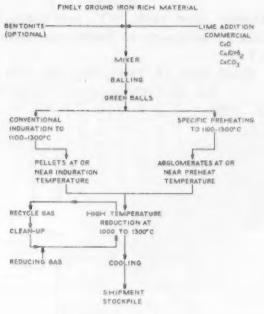
Rodney L. Bleifuss, Coleraine, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 9, 1974, Ser. No. 459,391
Int. Cl.[2] C21B *13/08*
U.S. Cl. 75—34 **9 Claims**

1. A rapid high temperature direct reduction process for high silica, low alumina magnetitic iron ore agglomerates in which the silica is prefluxed to prevent the reduction inhibiting effect of the formation of FeO-silica slag, which process comprises:

A. admixing finely divided taconite concentrate containing more than about 2.5 percent free silica by weight with finely divided lime selected from the class consisting of burnt lime, lime hydrate and limestone,

B. adding said lime in amount sufficient to react with said free silica to reduce the same to less than about 2.5 percent,



C. forming the ore-lime mixture into agglomerates,

D. heating said agglomerates to a temperature between about 1100° and 1300° C to substantially completely react said lime with at least said free silica in excess of 2.5 percent to flux the agglomerates to a basicity of about 1, and

E. while at said temperature subjecting said agglomerates to a reducing atmosphere rich in reducing gases selected from the class consisting of hydrogen, carbon monoxide, and mixtures containing the same at a high temperature between about 1100° and 1300° C for a time sufficient to achieve substantially complete reduction of said ore.

3,910,787
PROCESS FOR INHIBITING FORMATION OF INTERMETALLIC COMPOUNDS IN CARBOTHERMICALLY PRODUCED METALS

Alex R. Valdo, Elgin, Ill., and Freeman M. Sanderford, Dalton, Ga., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 164,952, July 21, 1971, Pat. No. 3,704,117, which is a continuation-in-part of Ser. No. 744,307, July 12, 1968, Pat. No. 3,615,343. This application Sept. 11, 1972, Ser. No. 287,974The portion of the term of this patent subsequent to Oct. 26, 1988, has been disclaimed.
Int. Cl.[2] C22B *21/06*
U.S. Cl. 75—68 A **11 Claims**

1. In a process comprising carbothermically reducing an ore to form a molten alloy, the improvement in combination therewith for inhibiting the formation of intermetallic compounds in metal and metalloid-containing alloys produced by the carbothermic reduction of the ore and capable of undergoing peritectic decomposition, comprising the steps of transferring the molten carbothermically produced alloy from a carbothermic reduction furnace to a suitable container, maintaining the transferred alloy in the container at a temperature at least as high as the melting temperature of any undesirable intermetallic compound but below the melting temperature of at least one of the metals or metalloids in the alloy, the yield of which it is desired to increase, and then rapidly cooling the alloy, thereby minimizing the formation of an undesirable intermetallic compound.

3,910,788

AUSTENITIC STAINLESS STEEL

Tokio Fujioka; Kazuo Hoshino; Kenjiro Ito, and Takashi Igawa, all of Shin-Nanyo, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1974, Ser. No. 461,335

Claims priority, application Japan, Apr. 21, 1973, 48-44656

Int. Cl.[2] C22C *38/02, 38/06, 38/42, 38/58*

U.S. Cl. 75—125 **6 Claims**

1. Austenitic stainless steel that is provided with excellent drawability and stretchability and is highly resistant to delayed cracking essentially consisting of 1.0–2.5 percent Si, 1.5–5.0 percent Mn, 1.0–4.0 percent Cu, 6.0–9.0 percent Ni, 15.0–19.0 percent Cr, 0–0.5 percent of at least one of Al and Ti, not more than 0.06 percent C, not more than 0.03 percent N and balance Fe and incidental impurities, in which the total amount of C and N in the solid solution state is less than 0.04 percent.

3,910,789

COLOR CORRECTION PROCESS

Peter J. Hastwell, North Adelaide, Australia, assignor to Applied Research of Australia Pty. Limited, Adelaide, Australia

Continuation-in-part of Ser. No. 247,302, April 25, 1972, abandoned. This application Feb. 25, 1974, Ser. No. 445,670

Int. Cl.[2] G03G *13/22*

U.S. Cl. 96—1.2 **4 Claims**

1. A method of electrophotographically producing a full color print of a multicolor original with cyan and magenta and yellow pigmented developers including the steps of applying a high gamma charge to the surface of a photoconductor, exposing said surface to an image of said original through a pass red filter, subjecting said surface to the action of a cyan pigmented developer, applying a second high gamma charge to said surface, exposing said surface to an image of said original through a minus red filter, applying a low gamma charge to said surface, exposing said surface to an image of said original through a pass green filter, subjecting said surface to the action of a magenta pigmented developer, applying a third high gamma charge to said surface, exposing said surface to an image of said original through a minus green filter, applying a second low gamma charge to said surface, exposing said surface to an image of said original through a pass blue filter and subjecting said surface to the action of a yellow pigmented developer.

3,910,790

COLOR PHOTOGRAPHIC MATERIALS PROCESSED IN THE PRESENCE OF ANTI-COLOR FOGGING AGENTS

Karl Lohmer; Anita von König, both of Leverkusen, and Anneliese Müller, Cologne, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Jan. 25, 1974, Ser. No. 436,477

Claims priority, application Germany, Jan. 30, 1973, 2304321

Int. Cl.[2] G03C *7/00*

U.S. Cl. 96—56 **7 Claims**

1. A process for the production of colored images by chromogenic processing of color photographic material having at least one light sensitive silver halide emulsion layer by imagewise exposure and processing in color photographic processing bath comprising color developing with a color developer and color coupler and said process including processing in the presence of a stabilizing agent wherein the improvement comprises processing the exposed photographic material in the presence of a stabilizing amount of a 2-propynylthio derivative of the formula

$$R^1\text{-}S\text{-}CH_2\text{-}C \equiv C\text{-}R^2$$

in which

R^1 represents an alkyl, aryl or heterocyclic group selected from the group consisting of imidazole, oxazole, thiazole, triazole, tetrazole, oxdiazole, thiadiazole, benzimidazole, benzoxazole, benzthiazole, pyridine, pyrimidine, triazine, quinoline, quinazoline, purine,s-triazolo-[4,3-a]-quinoline and

R^2 represents hydrogen, sodium or potassium.

3,910,791

SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING A 2-PROPYNYLTHIO DERIVATIVE AS STABILIZER

Anita von König; Helmut Reuss, both of Leverkusen, and Anneliese Müller, Cologne, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 25, 1974, Ser. No. 436,478

Claims priority, application Germany, Jan. 30, 1973, 2304322

Int. Cl.[2] G03C *1/34, 1/48*

U.S. Cl. 96—76 R **8 Claims**

1. A light-sensitive photographic material for producing black and white images, comprising at least one silver halide emulsion layer and a stabilizer compound in an effective amount for stabilizing latent image nuclei occurring on the surface of the grain after imagewise exposure of the said silver halide emulsion layer wherein the improvement comprises the stabilizer compound is a 2-propynylthio derivative of the formula

$$R^1\text{-}S\text{-}CH_2\text{-}C \equiv C\text{-}R^2$$

wherein

R^1 represents alkyl of from 1–18 carbon atoms, aryl group or a heterocyclic group selected from the group consisting of imidazole, oxazole, thiazole, triazole, tetrazole, oxadiazole, thiadiazole, benzimidazole, benzoxazole, benzothiazole, pyridine, pyrimidine, triazine, quinoline, quinazoline, purine or a 3-triazolo [4,3-a] quinoline;

R^2 represents hydrogen, sodium or potassium.

3,910,792

GUANAZYL AND GUANAZILIUM SALT COMPOUNDS AS ANTIFOG AGENTS FOR SILVER HALIDE EMULSIONS

Agostino Baldassarri, Savona, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 29, 1974, Ser. No. 465,186

Claims priority, application Italy, May 10, 1973, 49895/73

Int. Cl.[2] G03C *1/34*

U.S. Cl. 96—76 R **23 Claims**

1. A silver halide photographic emulsion having in reactive contact therewith at least a fog-inhibiting amount of a guanazyl and/or guanazylium salt compound.

3,910,793

RADIOGRAPHIC DIFFUSION TRANSFER ELEMENT

Joel M. Peisach, Hudson, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 655,197, July 21, 1967, abandoned. This application Oct. 5, 1970, Ser. No. 78,229

Int. Cl.[2] G03C *1/48*

U.S. Cl. 96—76 R **11 Claims**

1. An integral photographic product for providing diffusion transfer image patterns comprising:

a. an intensifier-emulsion layer which contains a particulate luminophor and a photosensitive silver halide system, the amount of particulate luminophor being sufficient to render said intensifier-emulsion layer substantially opaque and

b. a receiving layer arranged to receive a diffusion transfer image pattern from said intensifier emulsion layer.

3,910,794

IMIDAZOLE COUPLERS FOR TWO COMPONENT DIAZOTYPE SYSTEMS

Abel Buisine, and Renaud de Torsiac, both of Arques la Bataille, France, assignors to La Cellophane, Paris, France

Filed Apr. 16, 1973, Ser. No. 351,437
Claims priority, application France, Apr. 20, 1972, 72.13898
Int. Cl.² G03C 1/58
U.S. Cl. 96—91 R 3 Claims

1. A two component diazo-type material suitable for making diazo-type reproductions comprising a base having a layer thereon consisting essentially of an acid stabilized mixture of at least one light-sensitive diazonium compound and at least one imidazole coupler compound selected from the group consisting of 2-mercaptoimidazole, 2-methylmercaptoimidazole, 2-ethylmercaptoimidazole, 2-acetylaminoimidazole, bis-(2-imidazolyl) 1,5-dithiopentane, 2-sulfamylimidazole, 2-phenacylthioimidazole, 4-acetylaminoimidazole, 1-methyl 2-mercaptoimidazole, 2-phenyl 4-acetylaminoimidazole hydrochloride, 2,5 diphenylimidazole, and 1,2-dimethyl 5-ethoxycarbonylaminoimidazole and mixtures thereof.

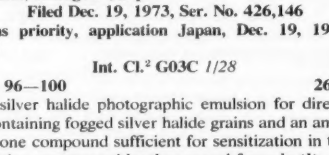
3,910,795

FOGGED, DIRECT POSITIVE SILVER HALIDE EMULSION SENSITIZED WITH A NITROPHENYL MERCAPTO HETEROCYCLIC COMPOUND

Keisuke Shiba; Masanao Hinata; Reiichi Ohi, and Tadao Shishido, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 19, 1973, Ser. No. 426,146
Claims priority, application Japan, Dec. 19, 1972, 47-127575
Int. Cl.² G03C 1/28
U.S. Cl. 96—100 26 Claims

1. A silver halide photographic emulsion for direct positives, containing fogged silver halide grains and an amount of at least one compound sufficient for sensitization in the blue color region represented by the general formula (I)



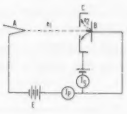
in which Z represents a group of non-metallic atoms necessary for forming a heterocyclic ring selected from the group consisting of a 1,2,4-triazole ring, a 1,3,4-thiadiazole ring, a 1,3,3a,7-tetrazaindene ring, a benzothiazole ring, a benziomidazole ring and a pyrimidine ring, and *n* represents an integer of from 1 to 3.

3,910,796

SECONDARY ELECTRON MULTIPLIER GLASS

Yoshiyuki Asahara, Kanagawa, and Tetsuro Izumitani, Hino, both of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Filed Mar. 5, 1974, Ser. No. 448,441
Claims priority, application Japan, Mar. 5, 1973, 48-25822
Int. Cl.² C03C 3/00
U.S. Cl. 106—53 3 Claims



1. A glass material for producing a secondary electron multiplying tube which consists, by mol percent, of V_2O_5 10 to 45, WO_3 0 to 45, Fe_2O_3 0 to 25, $WO_3 + Fe_2O_3$ 15 to 45, BaO 0 to 15, PbO 0 to 15, Phd $2O_5$ 30 to 75 and SiO_2 0 to 15.

3,910,797

ANTICORROSIVE COATING SYSTEM

Ronald W. Beers, Spring, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 198,457, Nov. 12, 1971, abandoned. This application July 31, 1972, Ser. No. 276,806
Int. Cl. C09d 5/10
U.S. Cl. 106—1 18 Claims

1. A coating composition which comprises:
1. 10 to 90 parts by weight of a water-free organic silicate selected from the alkyl, aryl, and alkoxy silicates; and
2. 2 to 50 parts by weight of a ketimine sufficient to cure said organic silicate on exposure to water.

3,910,798

MOULDING PROCESS

Michael John Shires, and John Edwin White, both of Reading, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 10, 1972, Ser. No. 296,138
Claims priority, application United Kingdom, Oct. 19, 1971, 48575/71
Int. Cl.² B28B 7/34
U.S. Cl. 106—38.3 10 Claims

1. In a process for the manufacture of an investment casting mould which comprises the steps of coating an expendable pattern by immersion in a fluid mixture comprising a refractory material, a binder, and a liquid dispersant; drying the coating; removing the pattern and firing the mold; the improvement comprising adding to said mixture a thickening agent in an amount sufficient to render the mixture thixotropic, and requiring a shear stress of at least 1000 dynes/cm² to break its structure from a solid to liquid.

3,910,799

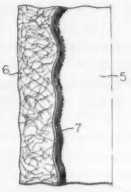
LEAD-ACID STORAGE BATTERY HAVING IMPROVED SEPARATORS

Ko Kondo, Takatsuki; Takashi Ito, Toyonaka, and Koichiro Ohtomo, Takatsuki, all of Japan, assignors to Kanebo, Ltd. and Ko Kondo, both of Tokyo, Japan, part interest to each

Filed Feb. 11, 1974, Ser. No. 441,271
Int. Cl. H01m 3/02
U.S. Cl. 136—145 17 Claims

1. A paste-type lead-acid storage battery having porous separators placed between the alternate positive and negative plates in the cells thereof, characterized in that at least part of

each separator, adhering closely to the surface of the positive plate, is composed of a sheet in the form of non-woven fabric of phenolformaldehyde resin fibers having an average diameter of less than 5 microns, said sheet being provided with a plurality of microporous openings of a size sufficiently small to prevent finely divided particles of the anode active material from passing therethrough.

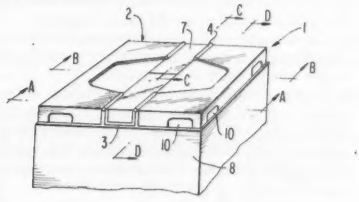


3,910,800

ELECTRICAL BATTERY

Chester Groby, Nol; Carl-Goran Crafoord, and John Grieves, both of Bromma, all of Sweden, assignors to Aktiebolaget Tudor, Stockholm, Sweden

Filed June 4, 1974, Ser. No. 476,319
Int. Cl. H01m *1/04*
U.S. Cl. 136—170 **11 Claims**



1. An electric storage battery having a casing including a cover member of an electrolyte-resistant insulating material, a plurality of cells each having positive and negative terminals and a liquid electrolyte with openings in the cover member for the inspection of the electrolyte level, and means for carrying said battery comprising an intermediate member fixed to the battery casing and having a raised portion extending along the longer dimension of the battery casing, a handle having a hand engaging central portion, and hinge means attaching the ends of said handle on opposite sides of said hand engaging central portion to the raised portion of said intermediate member, said handle being movable about the axis of said hinge means between a first position substantially parallel to the upper surface of the battery cover member and a second upright position allowing manual carrying of said battery.

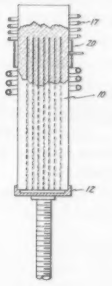
3,910,801

HIGH VELOCITY THERMAL MIGRATION METHOD OF MAKING DEEP DIODES

Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1973, Ser. No. 411,021
Int. Cl.² H01L *7/42*
U.S. Cl. 148—1.5 **7 Claims**

1. The thermal migration method for simultaneously producing a plurality of semiconductor bodies which comprises the steps of providing a monocrystalline matrix body of semiconductor material having selected conductivity and resistivity and having end surfaces and a side surface, forming recesses of depth less than about 30 microns in one end surface of the matrix body, substantially filling the recesses with a solid metallic material of different selected conductivity and resistivity with which the matrix body material will form a liquid solution of melting point temperature below that of the material of the matrix body, heating the matrix body and thereby forming in the recesses liquid solutions of the matrix material and the metallic material, migrating the resulting droplet in each recess toward the other end surface of the matrix body in a straight preselected path through the matrix body by establishing and maintaining a finite thermal gradient in a first direction through the said body and establishing and maintaining a zero thermal gradient through the said body in a direction normal to the first direction, and thereafter sectioning the matrix body transversely at a number of locations along its length to provide a plurality of separate semiconductor bodies.

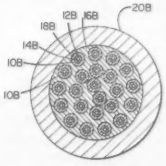


3,910,802

STABILIZED SUPERCONDUCTORS

James Wong, Wayland, Mass., assignor to Supercon, Inc., Natick, Mass.

Filed Feb. 7, 1974, Ser. No. 440,524
Int. Cl.² H01L *39/00;* **H01B** *12/00*
U.S. Cl. 148—32 **6 Claims**



1. Superconductive multi-filament wire product comprising, means defining a bronze matrix with a plurality of spaced filaments therein,

each of the filaments comprising a layer of type II superconducting intermetallic compound of Beta-Wolfram structure being the diffusion reaction product of a first elemental component derived from said bronze matrix and of a second elemental component derived from source filaments comprising a refractory metal outer layer,

means defining within each filament a copper core having a resistance ratio greater than 100 and being essentially free of said elemental components, and

the compound layers of the filaments being metallurgically bonded to the copper core.

3,910,803

METHOD OF PRODUCING DYNODE STRUCTURES

Jonathan Ross Howorth, Maldon, and Erik Werner Ludwig Trawny, Colchester, both of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Jan. 8, 1974, Ser. No. 431,787

Claims priority, application United Kingdom, Jan. 9, 1973, 1166/73

Int. Cl.[2] H01L 7/44, 21/00; C23F 1/00

U.S. Cl. 148—187 15 Claims

10. The method according to claim 9 wherein the rate of etching performed in step (*b*) is in the order of 1–2 μm per minute.

3,910,804

MANUFACTURING METHOD FOR SELF-ALIGNED MOS TRANSISTOR

Graham J. Alcott, Santa Monica, Calif., assignor to Ampex Corporation, Redwood, Calif.

Filed July 2, 1973, Ser. No. 375,657

Int. Cl.[2] H01L 7/44

U.S. Cl. 148—188 7 Claims

1. The method of fabricating a self-aligned MOS transistor on a substrate of semiconductor material which is doped with a selected first impurity having a first type of conductivity and which has a surface comprising steps of:

depositing a first layer of silicon dioxide on the silicon surface;

depositing a second layer of silicon nitride on the first layer of silicon dioxide;

removing the second layer of silicon nitride from a region coextensive with a transistor region in which the source, gate and drain of the transistor are to be formed;

diffusing phosphorus part way into the first layer in the transistor region to form a phosphosilicate glass extending from the surface of the first layer almost to the surface of the semiconductor material, the distance of the phosphosilicate glass from the silicon surface being dependent upon a desired gate dielectric thickness and being less than 5,000 Angstroms;

removing the phosphosilicate glass which is opposite a desired gate region of the transistor between desired source and drain regions;

forming a third, relatively thin layer of silicon nitride atop the existing arrangement of dielectric material to make the total thickness of dielectric opposite the gate region at least 1,000 Angstroms and not more than 5,000 Angstroms.

3,910,805

LOW TEMPERATURE GAS GENERATING COMPOSITIONS

Vincent Owen Catanzarite, Las Vegas, Nev., assignor to Specialty Products Development Corporation, Medina, Ohio

Continuation-in-part of Ser. No. 234,312, March 13, 1972, abandoned. This application Oct. 17, 1973, Ser. No. 407,269The portion of the term of this patent subsequent to Sept. 21, 1991, has been disclaimed.

Int. Cl.[2] C06B 29/08

U.S. Cl. 149—83 14 Claims

1. A pyrotechnic powder composition consisting essentially of a mixture of one or more oxidizer compounds containing oxygen and a metal selected from the group consisting of sodium, potassium, lithium, barium, magnesium and calcium, and one or more oxygen bearing metal organic compounds selected such that a stoichiometric reaction between the oxidizer and the metal organic compound yields gaseous products selected from the class consisting of carbon dioxide and water vapor and non-gaseous products of at least a binary mixture of metal salts having a melting point substantially below the melting point of any of the resultant metal salts and having a net heat of reaction less than about 1,000 calories per gram, the proportion of oxidizer compound to metal organic compound being no less than the stoichiometric proportion.

3,910,806

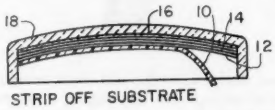
METHOD FOR METALIZING A CATHODE RAY TUBE SCREEN

James W. Schwartz, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 2, 1974, Ser. No. 429,604

Int. Cl.[2] B44C 1/10; G03C 5/00

U.S. Cl. 156—233 2 Claims



1. A method for making a luminescent screen on the concave surface of a curved faceplate for a color cathode ray tube, comprising (not necessarily in the following order):

depositing on the inner surface of the cathode ray tube faceplate a phosphor screen comprising interleaved patterns of red-emissive, blue-emissive and green-emissive phosphor materials held in a photosensitized volatilizable binder;

providing a web comprising a flexible and deformable sheet substrate, a release agent deposited on the substrate and an ultra-thin layer of electrically conductive, light-reflective metal deposited on the release agent;

applying to the layer of a metal a pressure-sensitive adhesive which volatizes at a temperature not exceeding the volatization temperature of said binder;

using a press having a contour related to that of the concave surface of the faceplate, pressing the web against the inner surface of the faceplate by successive contact of adjacent web areas so as to adhere the light-reflective layer to the phosphor screen without forming air bubbles under the web;

stripping off the substrate; and

baking the faceplate at a temperature effective to volatilize said binder and said adhesive to thereby leave a patterned phosphor screen covered with said ultra-thin layer of metal.

3,910,807

SEAM WELDING APPARATUS

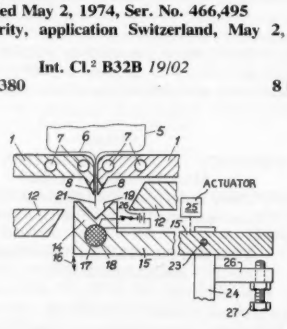
Hans Heinzer, Beringen, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Heuhausen am Rheinfall, Switzerland

Filed May 2, 1974, Ser. No. 466,495

Claims priority, application Switzerland, May 2, 1973, 6230/73

Int. Cl.[2] B32B 19/02

U.S. Cl. 156—380 8 Claims



1. An apparatus for forming a welded seam between at least two foils made of a synthetic material, the apparatus including

a pair of clamping shoes movable towards and away from one another and including cooperating work faces for firmly holding therebetween the foils in a face-to-face relationship, wherein the improvement comprises a heating bar having an operative position adjacent said work faces for fusing, by radiating heat, a marginal zone of the foils projecting beyond said work faces of said clamping shoes, said heating bar further having an inoperative position remote from said work faces; means for moving said heating bar from one of its positions into the other; and means defining channel means in at least one of said clamping shoes for accommodating a coolant; each said work face being planar and having an edge formed of a tooth row constituted by a plurality of spaced teeth, the two tooth rows being in a parallel-extending, adjoining relationship when the clamping shoes are in a clamping position; the space between any two adjacent teeth of one tooth row being defined by two lateral tooth walls intersecting in a straight edge, said straight edge being inclined with respect to the work face of the same clamping shoe.

3,910,808

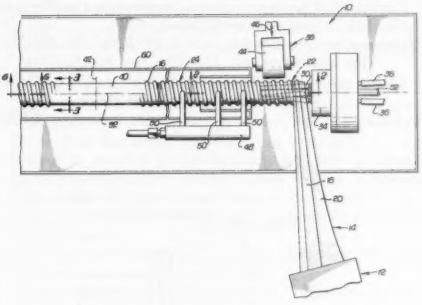
APPARATUS FOR MAKING HELICALLY WOUND PLASTIC TUBING

William L. Steward, Costa Mesa, Calif., assignor to Steward Plastics, Inc., Orange, Calif.

Continuation of Ser. No. 284,944, Aug. 30, 1972, abandoned. This application May 13, 1974, Ser. No. 469,234

Int. Cl.² B29D *23/04*, *23/12*; B31C *1/00*

U.S. Cl. 156—429 2 Claims



1. In an apparatus for making helically wound plastic tubing, the combination of:

a. means for extruding a plastic strip;

b. winding means for helically winding said strip about an axis into a tube with one edge of each convolution overlapping an edge of a preceding convolution;

c. said winding means comprising rolls circumferentially spaced apart around and extending in the direction of said axis;

d. said rolls being canted relative to said axis at acute angles;

e. means for driving said rolls;

f. cooling means extending along said axis and surrounded by said rolls for applying a liquid coolant to said tube internally thereof; and

g. said cooling means terminating within said tube in a downstream-directed spray opening which directs a jet of coolant against the interior of said tube, downstream of and in close proximity to said winding means, only in the downstream direction to assist in displacing said tube axially off said winding means, said rolls and said jet constituting the sole means for displacing said tube axially off said winding means.

3,910,809

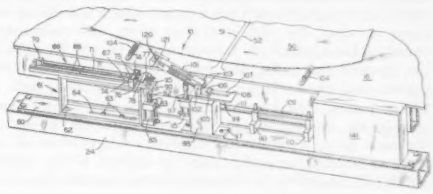
APPARATUS FOR PRODUCING INTERLAYERS FOR ANTENNA-TYPE WINDSHIELDS

Robert W. Fern, and Robert J. Bobel, II, both of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Feb. 19, 1974, Ser. No. 443,479

Int. Cl.² B31F *5/00*; H01Q *1/32*

U.S. Cl. 156—433 14 Claims



1. Apparatus for producing interlayers for antenna-type windshields comprising: a frame having a table thereon, a carriage mounted on said frame for reciprocable movement relative to said table, means on said carriage for applying and embedding antenna wire elements in a plastic sheet supported on said table, and means mounted on said carriage for laying a connecting tab on portions of said wire elements embedded in said plastic sheet in a predetermined orientation relative to said wire portions for subsequent securement thereto.

3,910,810

MACHINE FOR CONTINUALLY WORKING A WEB, PARTICULARLY BY WELDING AND SEVERING

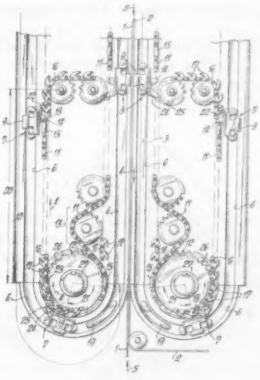
Dirk Godfried Johannes Roos, Amsterdam, Netherlands, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Dec. 27, 1973, Ser. No. 428,680

Claims priority, application Germany, Dec. 28, 1972, 2263885

Int. Cl.² B32B *31/18*

U.S. Cl. 156—510 8 Claims



1. A machine for working on a two-ply web, particularly on thermoplastic tubing, preferably by welding and severing, at transverse lines having a predetermined longitudinal spacing, during the manufacture of bags, comprising a plurality of tool carriers, which extend transversely to the longitudinal direction of the web and together with the web are movable in a plane through a working station and consist of pairs of individual carriers, which are disposed on opposite sides of the work-

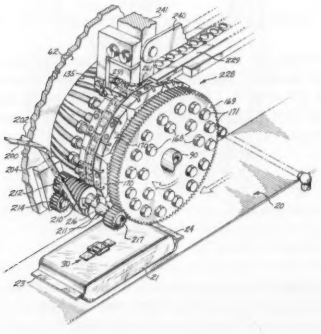
ing station, the individual carriers forming groups, which are disposed on opposite sides of the working station and caused to revolve in endless paths past the working station and back and are adapted to be advanced by drive means and in adjustable regular intervals are adapted to be introduced into the working station simultaneously in pairs by respecitive introducing means, which are independently controlled, which apparatus further comprises two endless coupling belts or chains which extend on opposite lateral sides of the working station and each of which has a course which extends in said plane in which the web is worked upon, and cooperating clamping faces, which are formed at both ends of the individual carriers and during the introduction of two individual carriers into the working station clamp the coupling belts or chains between them and thus carry the tool carrier along through the working station, which apparatus also comprises for each group of individual carriers on both sides of the working station respective pairs of endless return chains, which are adapted to be driven in synchronism with the introducing means and at least outside the working station follow the paths of revolution and carry regularly spaced, protruding flight cams, which engage the individual carriers from below, the two pairs of return chains being driven at the same velocity and with the flight cams in phase synchronism so that a simultaneous transfer of two individual carriers from respective groups to the introducing menas is ensured, characterized in that the machine defined first hereinbefore comprises for each group of individual carriers on each lateral side of the working station a pair of catching chains for the individual carriers, which catching chains follow the course of the paths of revolution at least approximately along the first half of the return course, and are driven to move in the same direction but at a lower speed than the return chains, and that the individual carriers and the catching chains are provided with one-way coupling means which prevent a relative movement between the individual carrier and the receiving chain opposite to the direction of revolution.

3,910,811

METHOD AND MACHINE FOR REMOVEABLY SECURING STIFF PLASTIC CLOSURES FLAT AGAINST SERIES OF MOVING PACKAGES

Jerre H. Paxton, Yakima, and Jack H. Holmes, Cowichi, both of Wash., assignors to Kwik Lok Corporation, Yakima, Wash.

Filed July 18, 1974, Ser. No. 489,471
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—521 **4 Claims**



1. In a machine for attaching stiff sheet plastic closures and the like flat against the respective exterior surfaces of a series of loaded bags, the combination of:

means for conveying said series of bags along a given path and through a work station;

means for advancing a flexible plastic tape, adhesive coated on one face only, along another given path converging toward said first mentioned path at said work station with the adhesive coated face of said tape turned toward a bag arriving at said station;

means for cutting the leading end portion of said tape into a series of strips in timed relation with the advancing of said tape;

means operating in timed relation with said cutting means to apply a closure flat against the adhesive coated face of each of said strips, leaving marginal adhesive coated tab means in said strip uncovered by said closure, each such closure and the strip adhering thereto comprising a closure-strip unit;

means for pressurally applying each such unit arriving at said work station to a loaded bag arriving at said station; means to coordinate said tape advancing, tape cutting, closure applying and unit applying means with the approach of said bags to said station to uniformly relate each closure-strip unit to the bag to which it is applied; and

means provided by said strip cutting means to form at least one slit in a side edge of each strip,

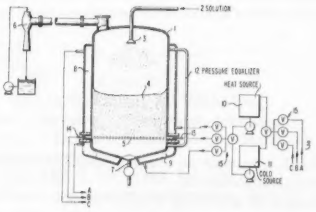
said slit being located alongside the closure applied to said strip.

3,910,812

APPARATUS FOR PRODUCING PHOTOGRAPHIC LIGHT-SENSITIVE SUBSTANCE BY SPRAY DRYING

Shiro Kaneko; Sakae Masuda; Motohiro Ujihara, and Yosuke Uchida, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Division of Ser. No. 224,438, Feb. 8, 1972, Pat. No. 3,847,616.
This application Jan. 22, 1973, Ser. No. 325,718
Claims priority, application Japan, Feb. 8, 1971, 46-5060
Int. Cl.[2] B01D *1/16;* **F25B** *29/00*
U.S. Cl. 159—3 **2 Claims**

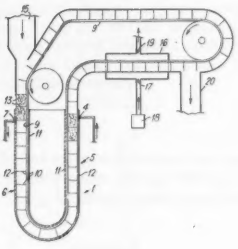


1. An apparatus for producing a photographic light-sensitive substance which comprises spray means for feeding and sprinkling a sol-form substance onto a horizontal, foraminous heat transferring means in the interior of a closed vessel which is connected to a vacuum producing means for removing vapors, the upper portion and lower portion of said closed vessel being separated by said heat transfer means and being interconnected by an external equalizing pressure pipe, a set of heat transfer jackets contiguously surrounding said upper and lower portions of said closed vessel, said jackets and heat transfer means being connected to both a heat source and cold source by valve means, said heat transfer means and jacket means being connected alternately to cool and heat the residue substance contacting the heat transfer means and the jackets.

3,910,813
TREATING WASTE PAPER CONTAINING PRESSURE RUPTURABLE MICROCAPSULES TO RECOVER THE INTERNAL PHASE OF THE MICROCAPSULES

Lawrence Westcott, Cefn Cribwr, near Bridgend, and Kenneth John Brinkworth, Penarth, both of Wales, assignors to Wiggins Teape Research & Development Limited, London, England

Filed Oct. 16, 1973, Ser. No. 406,850
Claims priority, application United Kingdom, Nov. 2, 1972, 50576/72
Int. Cl.[2] D21C *5/02*
U.S. Cl. 162—5 **12 Claims**



1. A method for treating waste paper broke comprising paper fibers and capsules having an internal phase material encapsulated within walls of the capsules to reclaim the internal phase material and the paper fibers and recover the internal phase material separate from the paper fibers, which method comprises:

disposing in a container a batch of strips of shredded broke, the density of the batch being sufficient to permit flow of a solution between the strips;

pumping into the container a solvent which is capable of penetrating the walls of the capusles containing the internal phase material and which solvent has a boiling point lower than that of the internal phase material;

allowing the solvent to flow between the strips and penetrate the walls of the capsules thereby to form an internal phase material-solvent solution in the container;

displacing the internal phase material-solvent solution from the container;

recovering the internal phase material and the solvent from the solution by distillation thereof;

removing the solvent-treated batch of strips from the container; and

removing solvent from the solvent-treated batch of strips and recovering the paper fibers.

3,910,814
RECONSTITUTED ASBESTOS MATRIX

Hoyt McBryar, Dickinson, Tex., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Jan. 22, 1973, Ser. No. 325,784
Int. Cl.[2] D21H *5/18*
U.S. Cl. 162—102 **9 Claims**

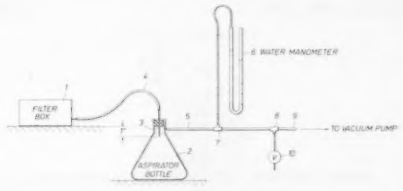
1. A process for the production of an asbestos matrix suitable for use in a fuel cell which comprises:

shredding a given quantity of asbestos material to form a non-matted bulk material of separated asbestos fibers;

forming a homogeneous randomly oriented slurry of said asbestos fibers in water or a low boiling liquid hydrocarbon to provide a uniform dispersion of the fibers in the water or liquid hydrocarbon;

deaerating said slurry by stirring and agitating the slurry to remove air bubbles and subjecting the slurry to a vacuum environment while stirring;

filtering out the asbestos fibers through a filter paper and porous plaque by drawing off the deaerated liquid of the slurry through the filter paper and plaque by applying a vacuum and leaving randomly oriented uniformly distributed asbestos fibers on the paper to form a homogeneous matrix of a thickness within a predetermined range of



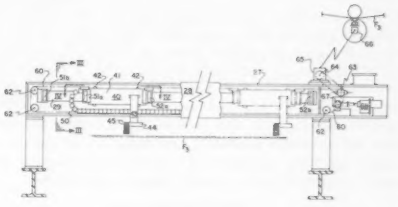
thickness and a uniformly constant porosity wherein the volume of interstices in the material exceeds the volume of its mass to provide a porosity ratio of substantially 70%; stripping the asbestos matrix from the filter paper and plaque; and

vacuum drying the matrix so produced.

3,910,815
METHOD AND APPARATUS FOR PAPERMACHINE FELT CLEANING

Clifford D. Shelor, Tyrone, Pa., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 26, 1974, Ser. No. 454,958
Int. Cl.[2] D21F *1/32;* **B08B** *3/02*
U.S. Cl. 162—199 **14 Claims**



1. A method of cleaning endless papermaking felts having planar width and closed loop length while moving longitudinally about the periphery of a closed course with a high energy hydraulic jet nozzle secured to a felt traversing vehicle disposed for reciprocatory movement substantially parallel to the plane of an adjacent portion of said felt in directions substantially parallel with the width thereof, said method comprising the steps of:

A. Providing said nozzle with a supply of high energy hydraulic fluid;

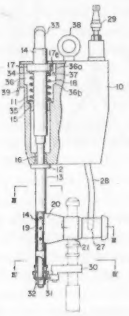
B. Directing a jet of said fluid from said nozzle against the surface of said felt, said jet forming an impact area with said felt surface, said impact area having a width dimension measured substantially parallel with said felt width; and,

C. Driving said traversing vehicle along one of said reciprocatory movement directions at a rate approximately equal to said impact area width dimension for each peripheral revolution of said felt about said closed course.

3,910,816
METHOD AND APPARATUS FOR REMOVING AN INCORE NEUTRON FLUX MONITOR

Teruaki Tsuji, and Shigeru Watanabe, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo Shibaura Electric Co., Ltd., Japan

Filed July 1, 1974, Ser. No. 485,004
Claims priority, application Japan, Sept. 5, 1973, 48-99172
Int. Cl. G21c *19/20*
U.S. Cl. 176—19 R 7 Claims



1. In a nuclear reactor wherein four square shaped fuel rod assembles are disposed in respective square shaped openings defined by crossing grids of a upper supporting plate, and an in-core monitor is disposed at a cross-point of said grids, a method of removing said in-core monitor comprising the steps of removing four fuel rod assemblies from a square shaped opening having a diagonal passing through said cross-point, removing one fuel rod subassembly from each of three square shaped openings about said in-core monitor and having diagonals respectively passing through said cross-point, inserting a holder-cutter assembly into a large vacant space formed by removing said four fuel rod assemblies for holding the upper portion of said in-core monitor, inserting a clamping device into one small vacant space formed by removing one of said three fuel rod assemblies which is diagonally opposite said removed fuel rod assembly for clamping a portion of said in-core monitor which is spaced from the portion thereof held by the holder of said holder-cutter assembly, severing said in-core monitor into two sections by operating the cutter of said holder-cutter assembly, and removing to the outside of said reactor the severed two sections while they are held by said clamping device and said holder, respectively.

3,910,817
METHOD AND APPARATUS FOR REMOVING RADIOACTIVE GASES FROM A NUCLEAR REACTOR

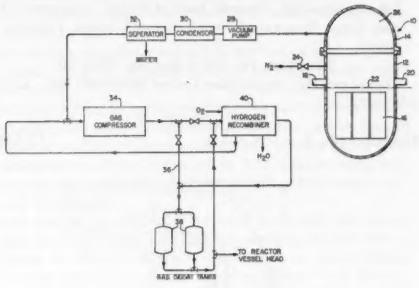
Robert Frunerman, Pittsburgh, and William W. Brown, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1972, Ser. No. 298,215
Int. Cl. G21c *9/00, 19/00*
U.S. Cl. 176—37 5 Claims

1. A method for removing radioactive and other gases from coolant circulated through a closed nuclear reactor comprising the steps of reducing the level of coolant in said reactor to provide a space bounded by the coolant surface at the reduced level and the exposed inside surfaces of the reactor, the space thus formed by the reduced level of coolant and the inside surfaces of the reactor comprising a vapor space;

circulating said coolant through the reactor to provide a turnover of coolant at the interface between the coolant surface and the vapor space to thereby effect the release of radioactive and other gases from said coolant into said vapor space;

charging said vapor space with an inert cover gas at a pressure of one atmosphere or less;

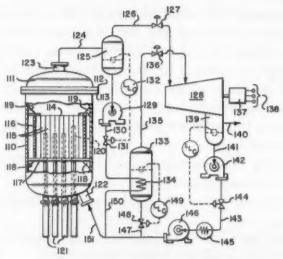


withdrawing said radioactive gases and all other gases released from the coolant along with the inert cover gas from the reactor vapor space.

3,910,818
METHOD FOR INCREASING THE BURN-UP CAPABILITY OF BOILING WATER NUCLEAR REACTORS CONTAINING PLUTONIUM-BEARING FUEL ASSEMBLIES

George A. Sofer, White Plains, N.Y., assignor to General Atomic Company, San Diego, Calif.

Filed Oct. 30, 1969, Ser. No. 872,665
Int. Cl. G21c *19/28*
U.S. Cl. 176—54 2 Claims



1. A method for utilizing plutonium enriched nuclear fuel in a boiling water nuclear reactor having a core consisting predominantly of uranium enriched fuel assemblies and adapted to recirculate water through said core at a predetermined flow rate comprising the steps of:

disposing in said core one or more fuel assemblies containing sufficient plutonium enriched fuel that the amount of plutonium enrichment disposed in said core exceeds by at least 20 per cent the amount of plutonium produced by the reactor during a normal uranium oxide fuel cycle;

beginning a fuel cycle by initiating reactor operation;

operating said reactor during a first portion of the fuel cycle with the void fraction of said boiling water reactor maintained substantially at a predetermined level;

reducing said void fraction by increasing the recirculation flow rate by between 10 and 30 per cent; and

operating said reactor during the end portion of said fuel cycle with said void fraction substantially maintained below said predetermined level by maintaining an increased recirculation rate until substantially the end of said fuel cycle.

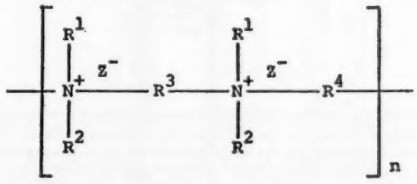
3,910,819
TREATMENT OF SURFACES TO STIMULATE BIOLOGICAL CELL ADHESION AND GROWTH

Alan Rembaum, Altadena; Marylou Ingram, La Canada; F. Agnes Stroud-Schmink, Pasadena, and Donald E. Rounds, Altadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Feb. 19, 1974, Ser. No. 443,751
Int. Cl.[2] C12B *3/00, 9/00*
U.S. Cl. 195—1.7 **13 Claims**

1. A method of promoting growth of biological cells in vitro comprising the steps of:

adding to a culture medium of the cells a minor growth promoting amount of a water-soluble, linear, ionene polyquaternary polyelectrolyte polymer having a molecular weight from 3,000 to 100,000, an average charge of at least one intrapolymeric quaternary nitrogen atom for an average of every twelve polymer chain atoms and a repeating unit of the formula:



where R^1 and R^2 are lower alkyl, R^3 and R^4 are divalent groups containing from 3–16 carbon atoms selected from alkylene, alkenylene, arylene, alkarylene and aralkylene or R^3 combined with R^1 and R^2 forms a cyclic group, Z^- is an anion and n is an integer;

culturing the cells in said medium; and

recovering said cells.

3,910,820
METHOD OF MAKING STARCH HYDROLYSATES BY ENZYMATIC HYDROLYSIS

Niels Christian Holt; Cornelis Bos, both of Holte, and Knud Viggo Rachlitz, Tastrup, all of Denmark, assignors to DDS-Kroyer A/S, Copenhagen, Denmark

Filed July 5, 1973, Ser. No. 376,374
Claims priority, application United Kingdom, July 5, 1972, 31499/72
Int. Cl.[2] C12D *13/02*
U.S. Cl. 195—31 R **7 Claims**

1. A method of making starch hydrolysates which comprises the steps of heating a slurry of milled maize grits to a temperature of from 50° to 65°C., maintaining said temperature for a period of from 1 to 5 hours, and subsequently subjecting the heat-treated slurry to an enzymatic hydrolysis.

2. A method as in claim **1**, wherein the enzymatic hydrolysis comprises the step of adding an α-amylase preparation to the heat-treated slurry and heating the slurry to a temperature of from 80° to 105°C. to form a liquefied starch product.

3,910,821
ENZYMATIC ISOMERIZATION PRODUCT

Robert Paul Cory, La Grange, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 292,849, Oct. 4, 1972, which is a division of Ser. No. 12,837, Feb. 19, 1970, abandoned. This application June 13, 1974, Ser. No. 479,064
Int. Cl.[2] C13D *13/04;* **C13K** *1/00, 11/00*
U.S. Cl. 195—31 F **10 Claims**

1. A levulose-bearing syrup which has been produced by the enzymatic isomerization of a glucose-containing solution by the action of a glucose isomerase enzyme preparation, wherein said levulose-bearing syrup is characterized as containing from about 40% to about 45% levulose by weight, on a dry basis and less than about 2% psicose, by weight, on a dry substance basis, said syrup being further characterized as being substantially free of color bodies and ash.

3,910,822
ISOLATION OF GLUCOCEREBROSIDASE FROM HUMAN PLACENTAL TISSUE

Peter G. Pentchev, Washington, D.C., and Roscoe O. Brady, Rockville, Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education, and Welfare, Washington, D.C.

Filed Mar. 14, 1974, Ser. No. 451,300
Int. Cl.[2] A61K *37/54;* **C07G** *7/026;* **C12K** *1/00*
U.S. Cl. 195—62 **2 Claims**

1. A process for isolating glucocerebrosidase comprising suspending in an aqueous pH6 phosphate buffer containing from about 0.5 mg/ml to about 25 mg/ml isooctylphenoxypolyoxyethanol and from about 0.5 mg/ml to about 25 mg/ml sodium taurocholate, the sediment layer resulting from centrifuging fresh ground placenta tissue in an aqueous medium at a temperature of from 1°C to 20°C for a period of from 5 minutes to 4 hours, homogenizing same, adding 247 grams/liter of ammonium sulfate, centrifuging the resulting mixture, adding 70.25 grams/liter ammonium sulfate to the resulting supernatant and centrifuging the mixture a second time, skimming the resulting glucocerebrosidase containing film, resuspending same in a pH6 citrate phosphate buffer containing from about 0.5 mg/ml to about 25 mg/ml isooctylphenoxypolyoxyethanol and from about 0.5 mg/ml to about 25 mg/ml sodium taurocholate, dialyzing the resulting mixture against a p H 9.2 citrate phosphate buffer, filtering the resulting enzyme and chromatographing said enzyme by ion enchange chromatography with a sodium chloride gradient ranging from 0 to 500 millimoles.

3,910,823
IMMOBILIZATION OF UREASE ON POROUS TITANIA

Ralph A. Messing, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

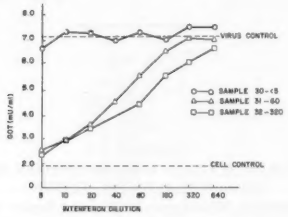
Filed Mar. 25, 1974, Ser. No. 454,140
Int. Cl.[2] C07G *7/02*
U.S. Cl. 195—63 **3 Claims**

1. A method of preparing an immobilized urease composite comprising the steps of reacting porous titania carrier particles having a particle size of between about 4 and 200 mesh, United States Standard Sieve, and an average pore diameter between about 300A and 590A and consisting of agglomerated titania particles with an aqueous solution of a stannous salt for at least 5 minutes to pre-treat the carrier surface and then reacting the pre-treated carrier with a urease solution.

3,910,824
INTERFERON ASSAY

Terrence Cartwright, Merton, England; Alan Asher Schwartz, Winnetka, and William Roy Smith, Glenview, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Oct. 18, 1973, Ser. No. 407,749
Int. Cl. G01n *31/14*
U.S. Cl. 195—103.5 R **5 Claims**



1. A method for the determination of the activity of interferon which comprises infecting a host cell which is sensitive to interferon with a virus which is not an interferon inducer for said host cell in the presence of interferon and measuring the level of intracellular enzymes released.

3,910,825
WATER-INSOLUBLE PEPTIDE MATERIALS

Fritz Hüper; Erich Rauenbusch; Günter Schmidt-Kastner, all of Wuppertal; Bruno Bömer, Leverkusen, and Herbert Bartl, Odenthal-Hahnenberg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 28, 1973, Ser. No. 345,792
Claims priority, application Germany, Mar. 30, 1972, 2215539
Int. Cl.[2] C12B *1/00*; C07G *7/02*; C12D *13/02*
U.S. Cl. 195—116 **28 Claims**

1. A water-insoluble preparation comprising a peptide material selected from enzymes and enzyme inhibitors bound to a cross-linked copolymer comprising the following copolymerized units:

A. 0.1 to 50 weight percent of at least one α,β-olefinically unsaturated dicarboxylic acid anhydride having 4 to 9 carbon atoms;

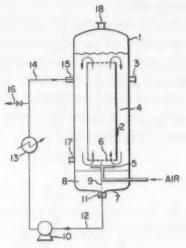
B. 99.9 to 50 weight percent of at least one di- and/or poly-(meth)acrylate of a diol and/or a polyol.

3,910,826
CULTIVATION APPARATUS FOR MICRO-ORGANISMS

Akihiko Kataoka, Chigasaki, Japan, assignor to Dainippon Ink & Chemicals, Inc. and Japan Gasoline Co., Ltd., both of Tokyo, Japan

Filed Jan. 9, 1974, Ser. No. 431,936
Claims priority, application Japan, Jan. 29, 1973, 48-012211
Int. Cl.[2] C12B *1/16*
U.S. Cl. 195—142 **5 Claims**

1. An apparatus for the aerobic cultivation of a microorganism, comprising: a fermentation vessel having a first discharge at the bottom thereof for discharging defoamed cultivation liquid from the vessel, a second discharge adjacent the upper end thereof for discharging gas from the vessel and inlet means for feeding cultivation liquid thereinto; a draft tube within said fermentation vessel, spaced from the internal wall thereof and defining therewith a first zone between said internal wall and said draft tube through which the cultivation liquid flows downwardly, said draft tube defining therewithin a second zone through which the cultivation liquid and an oxygen-containing gas flow upwardly, the upper and lower ends of said draft tube being spaced from the top and bottom of said fermentation vessel, respectively, the vertical distance between the lower end of said draft tube and said bottom of said vessel being in the range of from 0.5 to 1.5 times the diameter of said draft tube; an inlet for oxygen-containing gas disposed inside said vessel below said draft tube for directing said gas upwardly into said draft tube, said gas inlet being disposed at a vertical position in the upper one-third of the space between the lower end of said draft tube and the bottom of said vessed so that at least the lower two-thirds of said space forms a gas-liquid separating zone below said gas inlet



whereby gas bubbles are able to escape upwardly from the gas-liquid separating zone so that the cultivation liquid removed from said first discharge contains a reduced amount of gas; pumping means located outside of said vessel for removing cultivation liquid from said vessel through said first discharge; heat exchange means located outside of said vessel and connected to said pumping means for cooling the cultivation liquid fed by said pumping means; and conduit means extending from said heat exchanger for recirculating the cooled cultivation liquid into the upper part of said vessel.

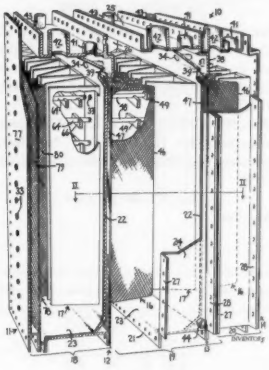
3,910,827
DIAPHRAGM CELL

Carl W. Raetzsch, Corpus Christi, Tex.; John F. Van Hoozer, Pittsburgh, Pa., and Hugh Cunningham, Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 160,339, July 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 54,816, July 14, 1970, abandoned, and a continuation-in-part of Ser. No. 836,082, June 24, 1969, abandoned. This application Apr. 5, 1973, Ser. No. 348,349
Int. Cl. C01b *7/06*, *11/26*; C01d *1/08*
U.S. Cl. 204—98 **9 Claims**

1. A method of operating a bipolar electrolyzer having a plurality of individual bipolar units in back-to-back bipolar configuration, with a peripheral wall around each individual bipolar unit; an anolyte chamber and a catholyte chamber in each individual bipolar unit, the anolyte chamber and catholyte chamber of an individual bipolar unit being separated from each other by a backplate having a surface of a ferrous metal on the catholyte side and titanium on the anolyte side; a plurality of hollow, wedge-shaped, inward and upward louvered, valve metal anodes in said anolyte chamber, said valve metal anodes having an electrically conductive surface thereon; valve metal conductors between the base of said valve metal anode wedges and the titanium surface of said backplate; the bases of said hollow, wedge-shaped, inward and upward louvered, valve metal anodes being held securely against said valve metal conductors; a plurality of hollow, wedge-shaped, metal cathodes in said catholyte chamber; said hollow, wedge-shaped metal cathodes being spaced from and electrically connected to the ferrous metal surface of said backplate; the hollow, wedge-shaped, valve metal anodes of one bipolar unit and the hollow, wedge-shaped cathodes of the next adjacent bipolar unit being interleaved between and uniformly spaced from each other and forming a single electrolytic cell therebetween; and a diaphragm therebetween dividing said single electrolytic cell into an anolyte chamber

and a catholyte chamber; which method comprises feeding sodium chloride brine into each of the individual electrolytic cells; passing an electrical current through the electrolyzer from the cathodes of one cell through the backplate to the anodes of the next adjacent cell in the electrolyzer; evolving chlorine in the anolyte chamber; collecting the evolved chlorine within the hollow, wedge-shaped anodes between the



inward and upward louvered metal walls thereof, thereby imparting an upward circulatory motion to anolyte liquor within the hollow, wedge-shaped anodes; recovering said chlorine at the top of said anolyte chamber; evolving hydrogen and caustic soda in said catholyte chamber; recovering said hydrogen at the top of said catholyte chamber; and recovering catholyte liquor from said catholyte chamber.

3,910,828

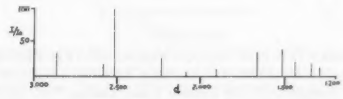
PRODUCTION OF CHLORINE

Cletus N. Welch, Barberton, Ohio, assignor to Nora International Company, Panama City, Panama

Division of Ser. No. 222,501, Feb. 1, 1972, Pat. No. 3,804,704. This application June 18, 1973, Ser. No. 371,226

Int. Cl. C01b *7/06;* **B01k** *3/06*

U.S. Cl. 204—128 **6 Claims**



1. In the process of evolving chlorine wherein an electrode pair is within an electrolyte and an electrical potential is established between said electrode pair, the improvement wherein the anode of said electrode pair comprises an electroconductive base member chosen from the group consisting of the valve metals and graphite, said base member having a surface thereon having a chlorine overvoltage of less than 0.30 volts at a current density of 500 amperes per square foot and consisting essentially of a delafossite chosen from the group consisting of platinum cobalt delafossite, palladium cobalt delafossite, palladium chromium delafossite, and palladium rhodium delafossite.

3,910,829

METHOD AND APPARATUS FOR THE DISINFECTION OF LIQUIDS BY ANODIC OXIDATION AND PRECEDING REDUCTION

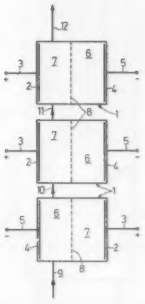
Volker Eibl, and August Reis, both of Munich, Germany, assignors to Sachs-Systemtechnik GmbH, Schweinfurt, Germany

Filed May 28, 1974, Ser. No. 473,377

Claims priority, application Germany, June 9, 1973, 2329630

Int. Cl.[2] C02B *1/82*

U.S. Cl. 204—151 **3 Claims**



1. A method of purifying an aqueous liquid contaminated with microorganisms which comprises:

a. causing said liquid to flow sequentially through respective first compartments of a first electrolytic cell and of a second electrolytic cell, each cell having a first compartment and a second compartment separated from said first compartment by a permeable diaphragm, each cell further having a first electrode in said first compartment thereof and a second electrode in said second compartment thereof;

b. passing direct electric current through said liquid in said first cell between the first electrode of said first cell as the cathode and the second electrode of said first cell as the anode;

c. passing direct electric current through said liquid in said second cell between the first electrode of said second cell as the anode and the second electrode of said second cell as the cathode; and

d. withdrawing the liquid in purified condition from the first compartment of said second cell.

3,910,830

FLUSH MOUNTED PROBE ASSEMBLY

Weldon D. Mayse, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Apr. 8, 1974, Ser. No. 458,604

Int. Cl. G01n *27/46, 27/30*

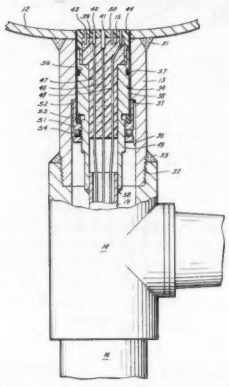
U.S. Cl. 204—195 C **12 Claims**

1. A flush mounted probe assembly comprising:

a. a nipple secured to a pipeline conduit which has an opening therethrough in axial alignment with said nipple, said nipple having a cylindrical smooth-walled inner surface adjacent said conduit, an enlarged cylindrical portion terminating in an abutment shoulder adjacent said cylindrical smooth-walled inner surface, and an end portion adapted to be secured to a valve means; and

b. a probe removably mounted in said nipple and including a cylindrical metal body carrying internally a rigid insulator mounting a plurality of metallic electrodes at one end of said body, said electrodes separated from one another by intervening, fluid-impervious insulating medium, said metallic electrodes and insulating medium having a com-

mon terminal planar surface aligned transversely to the longitudinal axis of said body, sealing means carried circumferentially about said body to cooperate with said cylindrical smooth-walled inner surface of said nipple thereby forming a fluid tight seal therebetween, a longitudinally adjustable metal stop means on said body to engage said abutment shoulder on said nipple whereby said terminal planar surface of said electrodes and said insulating medium is positioned a certain distance from the interior wall surface of said pipeline conduit, locking means to secure said metal stop means against displacement on said body, a tubular extension carrying electrical conductors extending in electrical isolation from said body to form an external circuit connector, and securing means to hold said body in said nipple with said metal stop means in contact with said abutment shoulder of said nipple.



3,910,831

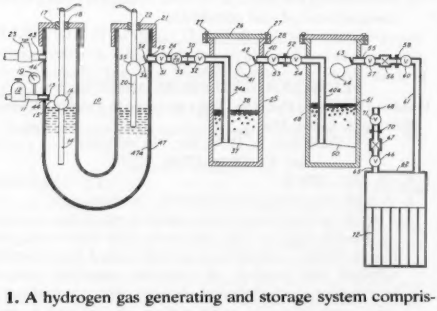
HYDROGEN GENERATING SYSTEM

Alfred G. Helart, 1582 S. Eaton St., Lakewood, Colo. 80226

Filed Mar. 18, 1974, Ser. No. 452,207

Int. Cl.[2] C25B *1/04*; **C25D** *15/08*; **B01J** *1/22*

U.S. Cl. 204—278 **10 Claims**



1. A hydrogen gas generating and storage system comprising:

means utilizing the electrolysis of water for producing oxygen and hydrogen and including means providing zones for collecting and for discharging the two gases separately;

means for supplying water to said producing means and for maintaining a predetermined range of pressures in said system;

a reservoir for storing the hydrogen gas at the pressure maintained by said supplying means and connected to the hydrogen zone of said producing means;

a body of lanthanum-nickel in said reservoir for raising the storage capacity thereof; and,

means for withdrawing hydrogen from said reservoir for use.

3,910,832

TOOL FOR DRILLING COOLING PASSAGES IN TURBINE BLADES

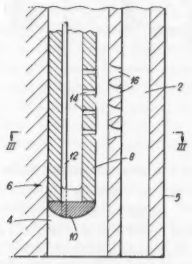
Ernest Victor Tuck; Derek Aubrey Glew, and Ian Dennis Bishop, all of Filton, England, assignors to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Division of Ser. No. 174,037, Aug. 23, 1971, abandoned. This application May 16, 1973, Ser. No. 360,980

Claims priority, application United Kingdom, Aug. 27, 1970, 41357/70

Int. Cl. B01k *3/04*

U.S. Cl. 204—284 **4 Claims**



1. A tool for electrolytically drilling a lateral branch from a passage in a metal workpiece, comprising a tube of insulating material having a hole in its side wall; a wire within the tube lying against an internal surface thereof opposite said hole and fixed at each end to said tube, said wire being substantially thinner than the bore of the tube and off-set relative to the longitudinal axis of the tube; and a plug closing one end of said tube, said hole lying to one side of a plane through said axis and said wire lying wholly on the other side of said plane.

3,910,833

APPARATUS FOR RECOVERING SILVER FROM PHOTOGRAPHIC FILM PROCESSING LIQUIDS

David R. Knighton, 6106 Linden Lane, Dallas, Tex. 75230

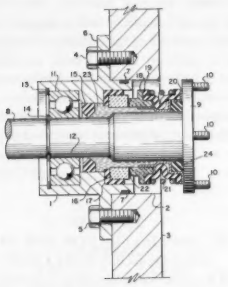
Filed Sept. 26, 1974, Ser. No. 509,394

Int. Cl.[2] C25C *7/00*

U.S. Cl. 204—273 **9 Claims**

1. An apparatus for recovering silver from photographic film processign liquids which comprises: an electrolytic cell having electrode means to effect recovery of said silver by electrolysis; a rotary agitator means connected to a rotating shaft to agitate liquid within said cell; a driver means to rotate said shaft; and a seal means for sealing said shaft including (a) a shaft housing for mounting in an aperture in the wall of said cell, (b) bearing means within said housing to rotationally engage and support said shaft, (c) a rotating seal member surrounding and affixed to said shaft, said rotating seal member contacting and forming a seal face with a stationary seal

member within said housing and said rotating seal member being affixed to said shaft so as to form a liquid reservoir between said shaft and said housing at a location intermediate



said seal face and said bearing means and (d) means for maintaining a seal liquid in said reservoir at a pressure sufficient for said seal liquid to be forced onto said seal face as said shaft rotates.

W18

3,910,834

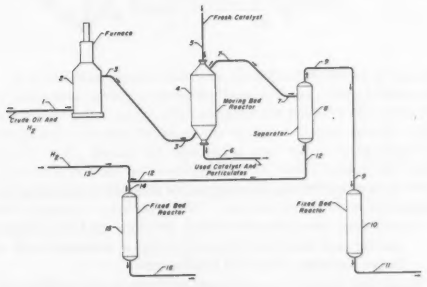
MOVING BED REACTOR CONVERSION PROCESS FOR PARTICULATE CONTAINING HYDROCARBONS SUCH AS SHALE OIL AND TAR-SANDS OIL

Robert F. Anderson, La Grange Park, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 29, 1972, Ser. No. 284,689

Int. Cl.² C10G *1/08, 13/16, 23/08, 37/02*

U.S. Cl. 208—59 **20 Claims**



1. A process for the filtration and hydroprocessing of a particulate-containing tar-sand oil or shale oil which comprises the steps of:

a. continuously passing said oil into the bottom of a reactor in admixture with hydrogen;

b. intermittently passing quantities of catalyst into the top of the reactor and removing quantities of catalyst and entrained particulate matter from the bottom of the reactor to effect a catalyst transfer through the reactor;

c. measuring the pressure drop between the bottom of the reactor and the top of the reactor; and,

d. adjusting the rate of catalyst transfer to effect an adjustment of the pressure drop to a preselected pressure drop which corresponds to a desired rate of filtration in the reactor.

3,910,835

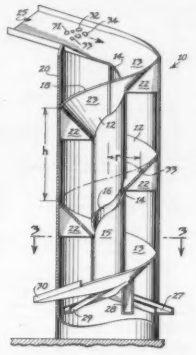
APPARATUS AND METHOD FOR SEPARATING PARTICLES HAVING DIFFERENT COEFFICIENTS OF FRICTION

Richard D. Stafford, 710 S. 1st St., Nashville, Tenn. 37210

Filed Dec. 26, 1973, Ser. No. 427,675

Int. Cl.² B07B *13/10*

U.S. Cl. 209—115 **4 Claims**



1. The method of separating non-spherical, metal scrap particles having different coefficients of friction comprising the steps of:

a. Selecting a plurality of said particles, at least some of which have different coefficients of friction from the others, having shapes permitting said plurality of particles to have non-rolling, sliding movement down the continuous, uninterrupted surface of a helical slide member having a vertical axis,

b. feeding said plurality of particles downward substantially tangentially along the upper portion of said slide member surface causing said particles to have solely non-rolling, sliding movement down said surface of said helical slide member,

c. guiding said moving individual particles in sliding frictional engagement with the surface of said helical slide member for a predetermined number of a plurality of turns, causing said particles to follow trajectories dependent upon the individual coefficients of friction of said particles until each particle moves in a spiral stable trajectory radially equidistant from the center of said vertical axis,

d. the position of each said particle in any radial, vertical plane of said helical path being disposed in a line at an angle to the horizontal of at least 0° and less than 90°, and e. removing groups of non-spherical, metal scrap particles of different coefficients of friction from correspondingly different stable trajectories on the slide member below said predetermined number of turns.

3,910,836

PYROCHLORE FLOTATION

Raymond Raby, and Clement J. Desrochers, both of Ste. Foy, Canada, assignors to Soquem, Montreal, Canada

Continuation-in-part of Ser. No. 311,282, Dec. 1, 1972, abandoned. This application July 29, 1974, Ser. No. 492,704

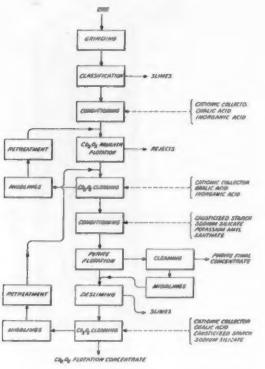
Claims priority, application United Kingdom, Jan. 29, 1972, 4307/72

Int. Cl.² B03D *1/02*

U.S. Cl. 209—166 **8 Claims**

5. A process for beneficiating by froth flotation an ore containing small amounts of the columbium-bearing mineral pyrochlore and large quantities of gangue materials, including large quantities of carbonates, which comprises grinding said

ore to a small particle size suitable for separation of the columbium-bearing minerals by froth flotation, subjecting an aqueous pulp of the so-ground ore, in the presence of a cationic collector of the diamine acetate type, having a carbon chain length of 10 to 22 carbon atoms, a dispersing agent acting in combination with the collector, a modifying agent providing a source of free oxalate ions from the group consisting of oxalic acid and oxalate salts, at least one gangue depressant from the group consisting of caustic starch, sodium silicate and lactic acid to depress the carbonates in combination with the modifying agent, and an inorganic acid from the group consisting of HF, H_2SO_4, HCl and H_3PO_4, to froth flotation at a pH of below 7 and forming a concentrate rich in the pyrochlore mineral and a columbium-lean tailing and collecting said concentrate.



3,910,837

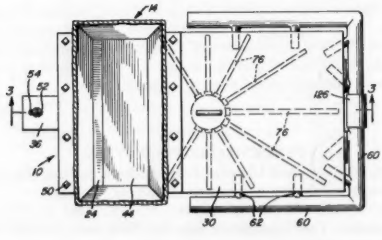
PORTABLE PLACER MINING APPARATUS

Elmer J. Good, 14295 El Capitan, Delhi, Calif. 95315

Filed Dec. 19, 1973, Ser. No. 426,073

Int. Cl.[2] B03B *5/02*

U.S. Cl. 209—461 **4 Claims**



1. A portable placer mining apparatus including a sluice box having a generally flat bottom and upstanding peripheral walls, an inlet for water under pressure opening through one upstanding wall of the box toward the remote marginal portion of the box, said remote marginal portion including a water outlet formed in the corresponding upstanding wall elevated above the bottom wall of the box, generally horizontal and radially arranged riffle rods spaced about and extending outward from a central zone of said box intermediate said inlet and outlet and spaced slightly above said bottom wall and, a plurality of water jet outlets spaced about the periphery of said remote marginal portion of said box, said water jet outlets being disposed to direct generally horizontal jets of water therefrom inwardly at an elevation above said rods and towards a central area of said box disposed to the side of said central zone toward said remote marginal portion.

3,910,838

METHOD AND APPARATUS FOR THE PURIFICATION OF AQUEOUS EFFLUENT

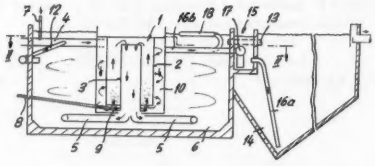
Joseph Richard Kaelin, Villa Seeburg, CH-6374 Buochs, Switzerland

Filed June 29, 1973, Ser. No. 374,959

Claims priority, application Switzerland, July 2, 1972, 9909/72

Int. Cl.[2] C02C *1/08*

U.S. Cl. 210—7 **32 Claims**



1. A method for purifying aqueous effluent comprising the steps of:

conducting said effluent directly into one end of a closed mixing tank which is disposed within a residence tank of larger capacity than said mixing tank;

supplying oxygen or an oxygen mixture to said effluent as said effluent is conducted into said mixing tank;

conducting said oxygenated effluent through an extended flow path within said mixing tank so as to facilitate the reaction between said oxygen and said effluent;

discharging said oxygenated effluent from the other end of said mixing tank and into said residence tank through a plurality of discharge conduits disposed at a position adjacent to the floor of said residence tank and oriented such that a strong rotary flow is produced in the floor region of said residence tank so as to prevent the formation of sludge deposits within said floor region;

re-cycling a portion of said oxygenated effluent disposed within said residence tank back into said mixing tank along with said effluent supply at said one end of said mixing tank; and

removing excess oxygenated effluent from said residence tank.

3,910,839
SLIME INHIBITOR FOR USE IN INDUSTRIAL WATER RECIRCULATING SYSTEMS

Juhani Tuomarla; Kalervo Raisanen, both of Vaasa, and Aulis Arvinen, Porvoo, all of Finland, assignors to Kemira Oy, Helsinki, Finland

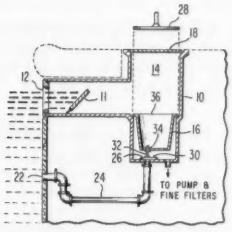
Filed Nov. 2, 1972, Ser. No. 303,673
Claims priority, application Finland, Nov. 5, 1971, 3170/71
Int. Cl.[2] A01N *9/22;* **C02C** *5/04*
U.S. Cl. 210—60 **4 Claims**

1. A method of inhibiting slime formation in a water recirculating system of a pulp or cellulose factory wherein said water contains at least one bacteria species selected from the group consisting of *Aerobacter aerogenes* and *Aspergillus niger* which comprises adding to said water system containing said bacteria an inhibiting concentration of 5-nitro-furfurylalcohol.

3,910,840
VALVE ACTUATOR

Charles R. Adam, Middletown, N.J., assignor to Cascade Industries, Incorporated, Edison, N.J.

Filed Dec. 10, 1973, Ser. No. 423,057
Int. Cl. B01d *35/00*
U.S. Cl. 210—91 **6 Claims**



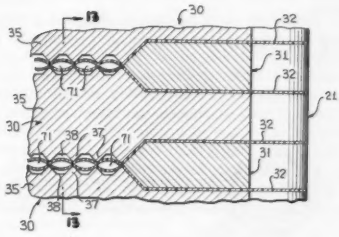
1. In combination with a swimming pool skimmer driven by a pump and having a skimmer basket, a deep water inlet and a trimmer valve, such valve being for the purpose of regulating the relative suction between the skimmer basket and the deep water inlet, means for operating said valve comprising an operative connection between the skimmer basket and said trimmer valve such that the position of said trimmer valve may be regulated by rotating said skimmer basket while it remains in place.

3,910,841
STACKED EXCHANGE DEVICE

William G. Esmond, 537 Stamford Road, Baltimore, Md. 21229

Filed Apr. 2, 1974, Ser. No. 457,213
Int. Cl.[2] B01D *25/12, 31/00*
U.S. Cl. 210—231 **18 Claims**

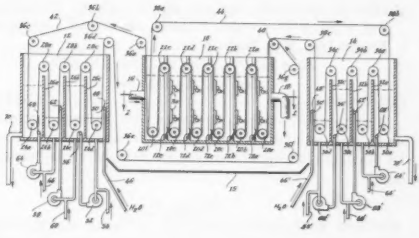
1. An exchange device comprising a plurality of first and second plates arranged in alternating relation, each of said plates including a frame, transfer films extending between said frames in sealed relation thereto, each first plate having a central core of greater thickness than its respective frame, flow passages formed in opposite faces of each central core, each second plate being open within the frame thereof with cores of adjacent first plates projecting thereinto, first flow means for introducing a first fluid between each core face and an adjacent transfer film for flow through the flow passages thereof, and second flow means for introducing a second fluid between two adjacent ones of said transfer films disposed between two adjacent ones of said cores, the thickness of each core being substantially equal to the combined thickness of the frames of a first plate and a second plate.



3,910,842
TWIN BELT ION EXCHANGE SYSTEM

Eskil L. Karlson, 43 Westover Lane, Stamford, Conn. 06902

Filed Jan. 6, 1975, Ser. No. 539,019
Int. Cl.[2] B01D *15/04*
U.S. Cl. 210—252 **18 Claims**

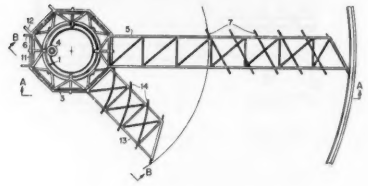


1. Apparatus for substantially deionizing solutions comprising: means for containing the solution to be treated; means for flowing said solution through said containing means in a first direction; a first endless fluid permeable belt having incorporated therein a first substance capable of removing anions; a second endless fluid permeable belt having incorporated therein a second substance capable of removing cations; means for passing each of said belts through said solution containing means in a series of traversals substantially perpendicular to said first direction; means for treating said first belt after passage through said solution to restore the anion removal capability of said first substance; and means for treating said second belt after passage through said solution to restore the cation removal capability of said second substance.

3,910,843
THICKENER MECHANISM

Anthony Grzina, Artarmon, Australia, and John Henry Ephraim Fedeler, Southbury, Conn., assignors to Warman Equipment (International) Ltd., Artarmon, Australia

Filed Dec. 21, 1973, Ser. No. 427,270
Claims priority, application Australia, Dec. 22, 1972, 1717/72
Int. Cl.² B01D *21/06*
U.S. Cl. 210—531 8 Claims



5. A thickener mechanism as claimed in claim 4 wherein the second cage is suspended from the top of the column by a circular monorail beam being engaged by a plurality of roller pairs mounted on the column and cage respectively.

3,910,844
LUBE OIL DISPERSANT OF IMPROVED ODOR AND ANTIOXIDANT PROPERTIES

Walter W. Hellmuth, Beacon; Harry Chafetz, Poughkeepsie, and William P. Cullen, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 9, 1973, Ser. No. 330,914
Int. Cl.² C10M *1/48*
U.S. Cl. 252—46.6 10 Claims

9. A composition in accordance with claim 5 comprising a major amount of lubricating oil and between about 0.1 and 10 wt. % of said detergent dispersant sulfurized alkoxylated product.

3,910,845
REACTION PRODUCTS OF FORMALS, ACETALS AND KETALS WITH SUCCINIC ACID OR ANHYDRIDE AS LUBRICATING OIL AND FUEL ADDITIVES

Marvin D. Coon, Vallejo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 22, 1973, Ser. No. 372,737
Int. Cl.² C10M *1/24*
U.S. Cl. 252—56 R 15 Claims

1. A fuel composition comprising a major amount of a normally liquid hydrocarbon fuel and from 10 ppm to 1,500 ppm of a reaction product of (i) a hydrocarbyl-substituted succinic acid or anhydride, wherein said hydrocarbyl substituent contains from about 30 to about 300 carbon atoms, and (ii) a formal, acetal, or ketal of a polyol and an acetalizing agent selected from the group consisting of C_1–C_{12} alkyl aldehydes, C_3–C_{24} alkyl ketone, and mixtures thereof; wherein the ratio of said succinic acid or anhydride to said formal, acetal or ketal is from about 1:3 to 3:1 and wherein the reaction takes place at a temperature from about 60°C to about 250°C.

3,910,846
METHOD OF PREPARING ELECTROSCOPIC TONER PARTICLES

Jack C. Azar, Rochester; Thomas R. Hoffend, Webster, and Jerome E. Martin, Red Creek, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 211,132, Dec. 22, 1971. This application Feb. 22, 1974, Ser. No. 446,196
Int. Cl.² G03G *9/10*
U.S. Cl. 252—62.1 P 14 Claims

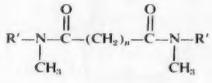
1. A method of preparing electroscopic toner particles comprising forming a fluid polyester having an acid content of about 0.02 milliequivalents to about 1.5 milliequivalents per gram of polyester and exhibiting a viscosity of less than about 300 poise, admixing said fluid polymer with an aqueous basic solution under high shear conditions thereby forming an emulsion; incorporating a coloring agent suitable for imparting color to developed electrostatic latent images and maintaining the pH of the emulsion at least about 8 with said aqueous basic solution, and drying the resulting emulsion to produce the electroscopic toner particles.

3,910,847
TERTIARY DIAMIDES

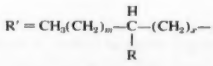
Robert M. Thompson, Wilmington, Del., assignor to Sun Ventures, Inc., St. Davids, Pa.

Division of Ser. No. 293,980, Oct. 2, 1972. This application Feb. 22, 1974, Ser. No. 445,008
Int. Cl.² C09K *5/00*
U.S. Cl. 252—77 5 Claims

1. In a process for transferring heat by means of an organic heat exchange fluid, the improvement which consists essentially of employing as the fluid at least one tertiary diamide having the following structural formula:



wherein
$n = 4$–12



wherein
R = H, alkyl radical having C_1–C_5
$m = 2$–8
$x = 1$–5.

3,910,848
LIQUID CLEANING COMPOSITION

Helmut H. Froehlich, and William Jacob Lautenberger, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 18, 1974, Ser. No. 452,339
Int. Cl.² C11D *3/26*
U.S. Cl. 252—90 3 Claims

1. A liquid cleaning composition dispensible from a container under pressure comprising

i. 5 to 30 parts of urea-formaldehyde polymer particles having a particle size of from 10 to 105 microns and an oil value of at least 90,

ii. 70 to 95 parts of halogenated solvent boiling at from 45° to 120°C.,

the total of (i) and (ii) being 100 parts, and

iii. 0.1 to 3.0 parts of finely divided silica antisettling agent,

iv. 0.1 to 2.0 parts of cationic antistatic agent, and

v. up to 125 parts of aerosol propellant selected from at least one of trichlorofluoromethane, dichlorodifluoro-

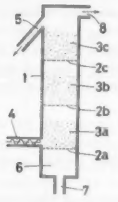
methane, 1,2-dichlorotetrafluoroethane, propane, isobutane and butane.

3,910,849

METHOD FOR MANUFACTURE OF ACTIVATED CARBON AND APPARATUS THEREFOR

Jun-Ichi Kawabata; Yonesiro Tazaki, both of Sapporo; Shigeo Mitsui, Ebetsu, and Kazuhiko Niikawa, Sapporo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jan. 4, 1974, Ser. No. 430,664
Claims priority, application Japan, Jan. 5, 1973, 48-2097
Int. Cl.² B01J *37/00*
U.S. Cl. 252—421 **2 Claims**



1. A method for the manufacture of an activated carbon from a powdered or granular carbonaceous substance selected from the group consisting of coal, wood dust, bark, and coconut husk comprising the steps of feeding the powdered or granular carbonaceous substance onto the lowermost of at least two horizontal perforated plates vertically spaced within a substantially uniform diameter column, said horizontal perforated plates being so adapted that the diameter of the holes pierced through the lowermost horizontal perforated plate is 1 to 2 mm and the hole ratio thereof is 0.5 to 2.0% and the diameter of the holes pierced through the second and subsequent horizontal perforated plates is 2 to 4 times the maximum diameter of the particles of carbonaceous substance and the hole ratio thereof is 20 to 30%, and at the same time causing a hot activating gas to ascend from below said lowermost horizontal perforated plate, the flow velocity of said activating gas being from 3 to 10 times the minimum flow velocity required for fluidizing the carbonaceous substance, thereby forming a fluidized bed of powdered or granular carbonaceous substance on each of said horizontal perforated plates and allowing only the portion of carbonaceous particles which have had their diameter reduced in consequence to the resultant activation in one of said fluidized beds to pass through a next higher horizontal perforated plate in conjunction with the ascending activating gas and, after the activating gas entraining the activated carbonaceous substance has reached the fluidized bed formed on the uppermost horizontal perforated plate, permitting the gas to be separated from the activated carbonaceous substance and to discharge through the topmost portion of the column, and separately recovering the activated carbonaceous substance from above the uppermost horizontal plate.

3,910,850

CONTOURED MONOLITHIC SUBSTRATE

Gordon James Turner, Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,060
Int. Cl.² B01J *35/02*
U.S. Cl. 252—455 R **1 Claim**

1. A catalytic converter for converting internal combustion engine exhaust gas components to innocuous entities which comprises a monolithic ceramic support having internal surfaces defining through holes adapted to pass said exhaust through said support, said internal surfaces having substantially uniformly deposited thereon an active catalyst for converting said exhaust to innocuous entities, said support having an end adapted to receive said exhaust and including three dimensional surface means at said end for distributing said exhaust in portions to said holes to effect substantially uniform contact of said deposited catalyst with said exhaust, said surface means defining at least a substantial part of said receiving end, said support having been prepared by a process consisting essentially of

a. preparing a mixture containing 20–50 percent by volume of a filler consisting of finely divided ceramic material selected from group consisting of alumina, spodumene, mullite, zircon magnesia mullite, spinel cordierite, and aluminum titanate, 5–50 percent by volume of a polyolefin having a molecular weight of about 150,000 to 2,000,000 and 20–60 percent by volume of a plasticizer selected from group consisting of glycol, glycerin, diethylene glycol, polyethylene glycol, polypropylene glycol, trimethylene glycol, alkyl phosphate, polyvinyl alcohol, partially hydrolyzed polyvinyl acetate, polyacrylic acid, and polyvinyl pyrrolidone,

b. compounding the mixture by heating to about 300°–550°F. with working to prepare a uniform mix,

c. extruding the mix to form a sheet and providing ribs thereon,

d. heating the ribbed sheet to about 350°–550°F. as measured on at least one of the sheet undersurfaces and the rib tops and winding the sheet about a mandrel to form a bonded structure,

e. cutting from the bonded structure a blank having a shape generally corresponding to the desired shape of the monolithic support and extracting the plasticizer,

f. providing three-dimensional hemispherical or parabolic cylindrical surface means on an end of the blank, said blank means and end corresponding respectively to said means and end of said support,

g. heating the blank having three dimensional surface means thereon to about 240°–700°C. to decompose and remove the polyolefin and sintering to a temperature of about 1,300°–1,600°C. for about 2–6 hours,

h. depositing a catalyst on the porous ceramic structure by contacting said structure with solutions of soluble salts of metals exhibiting catalytic activity for converting engine exhaust gases and heating to convert the metals to the active form,

i. cooling and recovering the catalytic converter.

3,910,851

METHOD OF MAKING POROUS INORGANIC BODIES USING WATER-SOLUBLE ZIRCONIUM COMPOUNDS

Ralph A. Messing, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sept. 17, 1973, Ser. No. 397,615
Int. Cl.² B01J *29/06, 29/00*; **C04B** *7/00*
U.S. Cl. 252—455 R **3 Claims**

1. A method for producing porous bodies from SiO_2, Al_2O_3, TiO_2 or mixtures thereof having pore diameters ranging between about 100A and 1000A wherein about 90 percent of the diameters fall within ±20 percent of the average pore diameter value, which comprises:

a. forming a uniform slurry consisting of particulate SiO_2, Al_2O_3, TiO_2, or mixtures thereof wherein the particle diameters thereof range between 100A and 1000A, the particle size being substantially uniform, and an aqueous 0.01 to 2M solution of a water-soluble zirconium compound;

b. drying the slurry at a temperature less than the boiling point of the solution; and

c. firing the dried material at 450°C. to 800°C.

3,910,852

CONDUCTIVE RESIN COMPOSITION

Burton E. Lederman, Philadelphia, and John J. Reilly, Treichlers, both of Pa., assignors to Conshohocken Chemicals, Inc., Rosemont, Pa.

Continuation-in-part of Ser. No. 126,895, March 22, 1971, abandoned. This application June 8, 1973, Ser. No. 364,061

Int. Cl. H01b *1/02*

U.S. Cl. 252—512 10 Claims

1. In an electrically conductive resin composition, the combination of

A. a low viscosity, relatively water free, pre-polymer phenolic resin of the type having formaldehyde as one component thereof and selected from the group of phenolic resins which includes dimethylol phenol, tri-methylol phenol and tri-methylol allyl phenol,

1. the said phenolic resin releasing formaldehyde within the composition; and

B. an intimate admixture of from 50% to 90%, by weight, of a particulated metallic filler material selected from the group consisting of oxide coated copper, oxide coated copper alloys and mixtures thereof.

3,910,853

1,1,4,4-TETRA METHYL-ALKYL-NITRILES-TETRAHYDRONAPHTHALENE PERFUME COMPOSITIONS

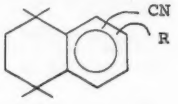
Kurt Kulka, New York, N.Y., assignor to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Filed July 29, 1974, Ser. No. 492,521

Int. Cl.[2] C11B *9/06*

U.S. Cl. 252—522 3 Claims

1. A composition for use in perfumes comprising at least ¼ % by weight of a tetramethyl-alkyl-nitrile-tetrahydronaphthalene and at least 1% by weight of a component which modifies the olfactory properties of said compound, said tetramethylalkyl-nitrile-tetrahydronaphthalene having the formula:



in which R is methyl or ethyl.

3,910,854

COMBUSTION CHAMBER CLEANING AND CORROSION PREVENTING AGENT

Hans Meyer, Am Birnbusch, Bechtheim, Taunus, Germany

Filed July 5, 1973, Ser. No. 376,675

Claims priority, application Germany, July 12, 1972, 2234172

Int. Cl.[2] C11D *7/04, 7/14;* C23G *1/16;* F23J *1/00*

U.S. Cl. 252—523 12 Claims

1. An alkaline cleaning composition suitable for removing deposits from combustion chamber and the like walls and for protecting such walls against corrosion, said composition being in the form of an aqueous solution or a liquid or dry concentrate and consisting essentially of:

a. a water soluble silicate and

b. at least one water soluble ammine complex selected from the group consisting of Zn, Cd, Cu and Sn, wherein the weight ratio of ingredients (a) to (b) is between about 5 to 40:1 to 10.

3,910,855

LIQUID CLEANING COMPOSITIONS

Richard M. Abeles, 42-30 Douglaston Parkway, Douglaston, N.Y. 11363

Continuation-in-part of Ser. No. 253,878, May 16, 1972, abandoned. This application July 7, 1972, Ser. No. 269,545

Int. Cl.[2] C11D *3/066*

U.S. Cl. 252—527 11 Claims

1. A cleaning composition consisting essentially of an aqueous lower alkanolic solution, wherein the ratio of lower alkanol to water is from about 1:4 to about 1:5550, of not more than about 25% of a mixture consisting essentially of

a. from about 30 to about 50%, by weight of said mixture, of at least one water-soluble polyoxyethylene nonionic detergent;

b. from about 15 to about 30%, by weight of said mixture, of at least one monoalkyl ether of ethylene glycol, the alkyl group containing 1 to 8 carbon atoms;

c. from about 1 to about 5%, by weight of said mixture, of an alkali metal salt of a dialkyl sulfosuccinate, in which each alkyl group contains from about 4 to about 16 carbon atoms;

d. from about 0.5 to about 8%, by weight of said mixture, of a sequestering agent selected from the group consisting of hydroxycarboxylic acids and aminopolycarboxylic acids;

e. from about 0.5 to about 5.5%, by weight of said mixture, of an anionic detergent; and

f. from about 0.2 to about 0.8 eq.% of at least one basic detergent builder selected from the group consisting of hydroxides, carbonates, bicarbonates, metasilicates, phosphates and tetraborates of sodium and potassium and alkali metal salts of weak inorganic acids.

3,910,856

PROCESS OF REDUCING FRICTION LOSS IN FLOWING HYDROCARBON LIQUIDS AND COMPOSITIONS THEREOF

Vitold R. Kruka, Houston, Tex., and Dale J. Meier, El Cerrito, Calif., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 242,860, April 10, 1972, abandoned, which is a division of Ser. No. 156,920, June 25, 1971, Pat. No. 3,687,148, which is a continuation-in-part of Ser. No. 5,156, Jan. 22, 1970, abandoned. This application Mar. 25, 1974, Ser. No. 454,652

Int. Cl.[2] C08K *5/01;* F17D *1/16*

U.S. Cl. 260—33.6 AQ 11 Claims

1. A composition for reducing friction in a conduit transporting crude oil comprising liquid crude oil having dispersed therein from 0.0001 to 0.2 weight percent of a two-block copolymer wherein a block A is substantially soluble in the liquid crude oil and has an average molecular weight between about 5×10^4 and 2×10^7, and a block B is substantially less soluble in the liquid crude oil and has an average molecular weight between about 5×10^2 and 5×10^5.

3,910,857

HIGH COMPRESSIVE STRENGTH ADHESIVE

Warren G. Phillips, Shelton, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Nov. 2, 1973, Ser. No. 412,392

Int. Cl.[2] C08K *3/08, 3/22*

U.S. Cl. 260—38 5 Claims

1. An adhesive consisting essentially of thermosetting resin and an inorganic filler and having a high compressive strength when set, wherein the thermosetting resin is selected from the group consisting of epoxy, phenolic and polyimide resins and wherein the filler consists of a mixture of metal and metal oxide and the proportions of resin are 60 to 20 parts by weight for each 40 to 80 parts by weight of filler and wherein the filler consists of a mixture of Al, Al_2O_3 and Fe_3O_4 in the ranges of 10–35%, 20–80% and 10–35% respectively.

3,910,858

NOVEL PROCESS AND PRODUCT

William A. Larkin, Morristown; Robert C. Ringwood, Jr., Sewaren, and Kenneth Treadwell, Rahway, all of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Division of Ser. No. 405,072, Oct. 10, 1973, Pat. No. 3,857,802. This application June 20, 1974, Ser. No. 481,132

Int. Cl.[2] C08K *3/26, 5/59;* **C08L** *27/06*

U.S. Cl. 260—42.49 **2 Claims**

1. In an improved composition for imparting flame retardancy to flexible and semiflexible polyurethane foams wherein said composition consists essentially of antimony trioxide and between 40 and 70 percent, based on the weight of said composition, of a finely divided halogen-containing polymer, the improvement which resides in the presence of barium carbonate in an amount between 2 and 50 percent, based on the combined weight of antimony trioxide and barium carbonate.

3,910,859

HEAT-STABLE POLYIMIDE RESIN FROM BIS-IMIDE, POLYAMINE AND ALAZINE

Michel Bargain, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

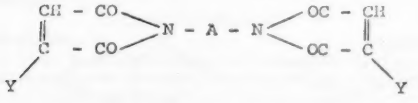
Continuation-in-part of Ser. No. 228,232, Feb. 22, 1972. This application Mar. 5, 1974, Ser. No. 448,261

Int. Cl.[2] C08G *69/26*

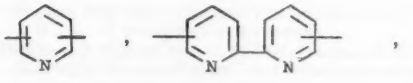
U.S. Cl. 260—47 UA **22 Claims**

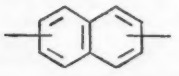
1. A heat-stable resin consisting essentially of the three-dimensional polyimide obtained by reacting at between about 50° and 350°C. at least one reactant from each of the following four groups:

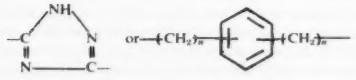
i. a bis-imide of the general formula:



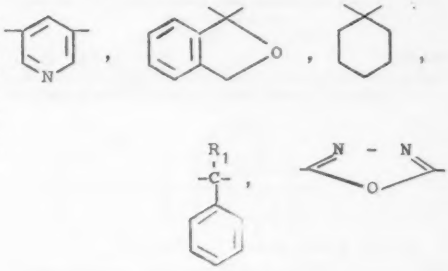
in which Y denotes H, CH_3 or Cl, and A represents a linear or branched alkylene radical having less than 13 carbon atoms, a phenylene or cyclohexylene radical or one of the radicals of formulae:







wherein *n* represents an integer from 1 to 3 or a divalent radical with 12 to 30 carbon atoms consisting of phenylene or cyclohexylene radicals bonded to one another by a simple valency bond or by —O—, —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, —SO_2—, —NR_1—, —N=N—, —CONH—, —COO—, —P(O)R_1—, —CONH—X—NHCO—,

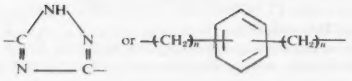


wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or a phenyl or cyclohexyl radical and X represents an alkylene radical with less than 13 carbon atoms,

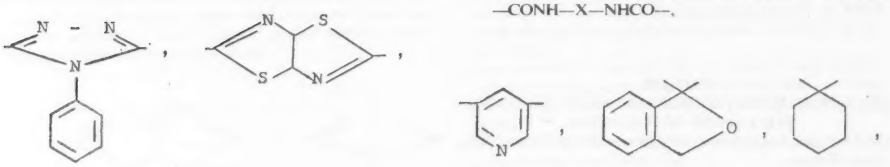
ii. a polyamine of the general formula:

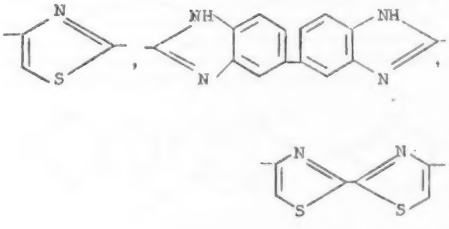
$$R(NH_2)_x$$

in which *x* represents an integer from 2 to 5 and R denotes an organic radical of valency *x*, and selected from the group consisting a 3 to 5 valent benzene, methylbenzene, naphthalene, pyridineor triazine radical, a 3 to 5 valent radical consisting of phenylene radicals bonded to one another by a simple valency bond or by —O—, —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, —SO_2—, NR_1—, —N=N—, —CONH—, —COO—, —P(O)R_1—, —CONH—X—NHCO—,

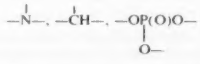


wherein *n* represents an integer from 1 to 3 or a divalent radical with 12 to 30 carbon atoms consisting of phenylene or cyclohexylene radicals bonded to one another by a simple valency bond or by —O—, —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, —SO_2—, —NR_1—, —N=N—, —CONH—, —COO—, —P(O)R_1—, —CONH—X—NHCO—,

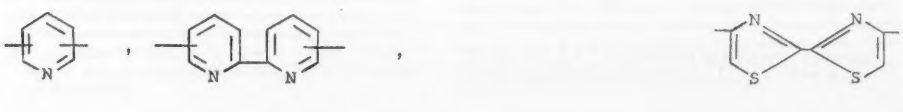




wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or a phenyl or cyclohexyl radical and X represents an alkylene radical with less than 13 carbon atoms,



and —P(O)—, a linear or branched alkylene radical having less than 13 carbon atoms, a phenylene or cyclohexylene radical or one of the radicals of the formulae:



wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or a phenyl or cyclohexyl radical and

iii. an alazine of the general formula:

$$G - CH = N - N = CH - G$$

in which G represents a monovalent carboxyclic aromatic radical, and

iv. up to 5% by weight relative to the weight of (i), (ii) and (iii) of an anhydride of a tricarboxylic or tetracarboxylic aromatic carbocyclic acid, in amounts such that if N_1 represents the number of mols of bis-imide employed, N_2 represents the number of mols of polyamine employed and N_3 represents the number of mols of alazine employed, the ratio

$$\frac{N_1}{\frac{2N_2 + N_3}{x}}$$

is from 1.3 to 10, x being defined as above.

3,910,860

FIBERS OF ACID-DYEABLE POLYESTER HAVING TERMINAL TETRAMETHYLPIPERIDINE GROUPS

Murty S. Tanikella, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 419,440, Nov. 27, 1973, abandoned, and Ser. No. 403,324, Oct. 3, 1973, each is a continuation-in-part of Ser. No. 290,771, Sept. 20, 1972, abandoned. This application Sept. 16, 1974, Ser. No. 506,585

Claims priority, application Germany, Sept. 17, 1973, 2346734

Int. Cl.² C08G *63/68*

U.S. Cl. 260—76 **9 Claims**

1. Acid - dyeable textile fibers or filaments of a linear terephthalate polyester characterized by the presence, as terminal groups on polyester molecules, of a 2,2,6,6-tetramethylpiperidine compound attached by a single ester-forming substituent at the 1 position or 4 position of the tetramethylpiperidine ring sufficient to provide at least 0.02 weight percent nitrogen.

3,910,861

PROCESS FOR THE PREPARATION OF GRANULAR OR POWDERY POLYAMIDE

Wilhelmus P. Wolvers, Sittard; Pierre J. Franssen, Stein, and Jean M. M. Warnier, Urmond, all of Netherlands, assignors to Stamicarbon, N.V., Geleen, Netherlands

Continuation of Ser. No. 203,434, Nov. 30, 1971, abandoned. This application Aug. 30, 1973, Ser. No. 393,230

Claims priority, application Netherlands, Dec. 5, 1970, 7017791; May 15, 1971, 7106704

Int. Cl.² C08G *69/18*

U.S. Cl. 260—78 L **10 Claims**

1. In a process for the preparation of polyamides in solid granular or powdery form by solution polymerization of at least one lactam monomer, using an anionic catalyst and a promoter, in an inert solvent in which the lactam monomer is substantially soluble and the polyamide product is substantially insoluble, by employing a temperature below the melting point of the polyamide to be formed, the improvement wherein the polyamide is prepared in one-step and bis-ε-caprolactimether is present as promoter for said polymerization.

3,910,862

COPOLYMERS OF VINYL PYRROLIDONE CONTAINING QUARTERNARY AMMONIUM GROUPS

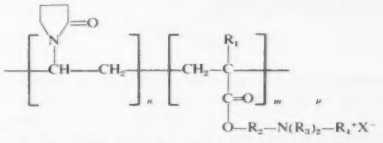
Eugene S. Barabas, Watchung, and Marvin M. Fein, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 7,250, Jan. 30, 1970, abandoned, and a continuation-in-part of Ser. No. 138,328, April 28, 1971, abandoned. This application Aug. 27, 1973, Ser. No. 392,271

Int. Cl.² C08F *15/00, 15/02*

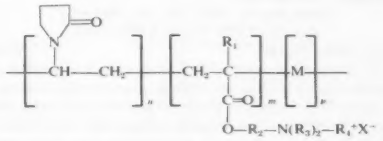
U.S. Cl. 260—79.3 MU **5 Claims**

1. A high molecular weight, film-forming quaternary ammonium polymer represented by the following formula:



wherein n ranges from about 20 to about 95 mole percent and m ranges from about 5 to about 80 mole percent; R_1 is selected from the group consisting of H and CH_3; R_2 is alkylene containing from about 2 to 20 carbon atoms; the R_3's are independently lower alkyl; R_4 is selected from the group consisting of alkyl of from 1 to about 8 carbon atoms and benzyl; and X is a member selected from the group consisting of halogen, SO_4, HSO_4, and alkyl sulfonic.

2. A high molecular weight, film-forming quaternary ammonium polymer represented by the following formula:



wherein n ranges from about 20 to about 95 mole percent, m ranges from about 5 to about 80 mole percent, p ranges from 0 to about 50 mole percent, and $n + m + p = 100$; R_1 is selected from the group consisting of H and CH_3; R_2 is alkylene containing from about 2 to 20 carbon atoms; the R_3's are independently lower alkyl; R_4 is selected from the group consisting of alkyl of from 1 to about 8 carbon atoms and benzyl; X is a member selected from the group consisting of halogen, SO_4, HSO_4, and alkyl sulfonic; and M is the residuum of a further copolymerizable vinyl monomer, said vinyl monomer being a member selected from the group consisting of alkyl vinyl ethers, acrylic and methacrylic acids and esters thereof, vinyl aromatic compounds, vinyl acetate, vinylidene chloride, vinyl chloride, acrylonitrile and derivatives thereof, methacrylonitrile derivatives thereof, acrylamide and methacrylamide and N-substituted derivatives thereof, and crotonic acid and esters thereof.

3,910,863

ARALKYL HALIDE COACCELERATOR

Edward L. Bowman, Alexandria, Va., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 150,233, July 4, 1971, abandoned. This application Jan. 24, 1973, Ser. No. 326,321

Int. Cl.² C08C *11/62, 11/44, 11/24*; **C08D** *9/00*

U.S. Cl. 260—79.5 B **12 Claims**

1. A method of vulcanizing a highly unsaturated elastomer which comprises:

a. forming a composition comprising:

1. a sulfur vulcanizable highly unsaturated elastomer;
2. a sulfur-based curing system; and,
3. an aralkyl halide having the formula

wherein R is selected from the group consisting of hydrogen and an aryl radical having from about 6 to about 16 carbon atoms with not more than one of said R groups being hydrogen and,

b. curing said composition.

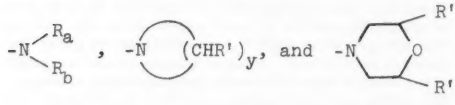
3,910,864

VULCANIZABLE RUBBER COMPOSITIONS

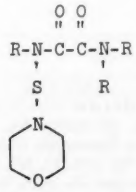
Pyong-Nae Son, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed June 6, 1973, Ser. No. 367,642
Int. Cl.[2] C08F *28/00;* **C08K** *5/47*
U.S. Cl. 260—79.5 B **7 Claims**

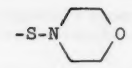
1. A vulcanizable composition comprising (1) a sulfur vulcanizable rubber having an olefinic unsaturation content of from about 0.5 percent to about 50 percent by weight of the rubber, (2) sulfur, (3) a thiazole sulfenamide accelerator of the formula T-S-A, wherein T is a thiazole ring group and A is selected from the group consisting of



where R_a and R_b are selected from the group consisting of hydrogen, an alkyl radical containing 1 to 24 carbon atoms, an aryl, alkaryl, or aralkyl radical containing 6 to 18 carbon atoms, and a cycloalkyl radical containing 3 to 8 carbon atoms, y is 2 to 7, and R′ is hydrogen or an alkyl radical containing 1 to 4 carbon atoms, and (4) a morpholinothiooxamide of the formula



wherein R is selected from the group consisting of hydrogen, alkyl radicals containing 1 to 24 carbon atoms, an aryl, alkaryl, or aralkyl radical containing 6 to 18 carbon atoms, a cycloalkyl radical containing 3 to 8 carbon atoms in the ring, and the group



3,910,865

SYNTHETIC RESIN OF STYRENE, ISOBUTYLENE AND 1,3-BUTADIENE

Robert A. Osborn, Stow, and Herbert L. Bullard, Norton Village, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 13, 1974, Ser. No. 469,262
Int. Cl.[2] C08F *236/04*
U.S. Cl. 260—80.7 **1 Claim**

1. A method of preparing a resinous material, characterized by having a softening point in the range of about 70° to about 100°C, which comprises polymerizing at a temperature in the range of about 20° to about 30°C a monomer mixture comprised of about 50 to about 65 weight percent styrene, about 20 to about 30 weight percent isobutylene and about 10 to about 25 weight percent 1,3-butadiene, where the mole ratio of isobutylene to butadiene is in the range of about 1/1 to about 2.5/1, in the presence of a catalytic amount of a catalyst selected from aluminum chloride and ethyl aluminum dichloride and, in the presence of an organic solvent containing dissolved water in an amount of about 50 to about 150 parts per million based on said solvent, but not exceeding the solvent's saturation level, where, after the reaction has begun, any additional styrene, isobutylene and 1,3-butadiene are added sufficiently slowly so that essentially no unreacted isobutylene and styrene monomers are allowed to accumulate in the reaction mixture, where the overall polymerizate contains about 60 to about 40 weight percent of said solvent selected from at least one of benzene, toluene, xylene, pentane, hexane and heptane and where said resinous material is recovered by first deactivating the catalyst with a material selected from an alcohol and lime followed by filtering and steam distilling the product to remove liquids therefrom.

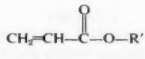
3,910,866

ACRYLATE RUBBER VULCANIZABLE COMPOSITIONS

Roger E. Morris, 2951 9th St., Cuyahoga Falls, Ohio 44221

Filed Sept. 17, 1973, Ser. No. 398,090
Int. Cl.[2] C08F *220/10*
U.S. Cl. 260—80.81 **19 Claims**

1. A composition comprising (1) an acrylate rubber consisting essentially of (a) from about 40 percent to about 99.8 percent by weight of an acrylate of the formula



wherein R′ is selected from the group consisting of an alkyl radical containing 1 to 18 carbon atoms, an alkoxyalkyl, an alkylthioalkyl, and a cyanoalkyl radical containing 2 to about 12 carbon atoms, (b) from about 0.1 percent to about 30 percent by weight of a halogen-containing monomer selected from the group consisting of halogen-containing vinylidene hydrocarbons and halogen-containing monomers having the halogen group at least two carbon atoms removed from an oxygen atom, (c) from about 0.1 percent to about 20 percent by weight of a carboxyl-containing monomer containing from 3 to about 8 carbon atoms, and (d) up to about 35 percent by weight of a copolymerizable monomer containing a terminal vinylidene group selected from the group consisting of phenyl acrylate, cyclohexyl acrylate, methyl methacrylate, ethyl methalcrylate, vinyl acetate, vinyl propionate, allyl acetate, methyl vinyl ketone, vinyl methyl ether, vinyl ethyl ether, allyl methyl ether, styrene, α-methyl styrene, vinyl toluene, acrylonitrile, methacrylonitrile, acrylamide, methacrylamide, N-methyl methacrylamide, butadiene, isoprene, divinyl benzene,

divinyl ether, and diethylene glycol diacrylate, and (2) a curative system consisting essentially of (a) from about 0.5 part to about 20 parts by weight of a nonalkali metal oxy compound selected from the group consisting of oxides, hydroxides, and carbonates of barium, lead, calcium, magnesium, strontium, copper, tin, iron, zinc, and cadmium, and (b) from about 0.1 part to about 5 parts by weight of a cure accelerator selected from the group consisting of quaternary ammonium salts, tertiary amines, and guanidines, said parts by weight of nonalkali metal oxy compound and cure accelerator based on 100 parts by weight of acrylate rubber.

3,910,867

SHAPED STRUCTURES OF ACRYLONITRILE POLYMERS WITH PERMANENT ANTISTATIC PROPERTIES

Francis Bentz, Cologne, and Günther Nischk, Dormagen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

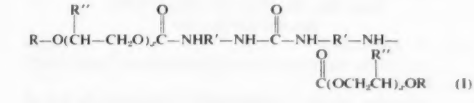
Filed Sept. 6, 1974, Ser. No. 503,768

Claims priority, application Germany, Sept. 15, 1973, 2346566

Int. Cl.[2] C08K *5/16*

U.S. Cl. 260—85.5 S **4 Claims**

1. A shaped structure of an acrylonitrile polymer consisting of from 85 to 99.5%, by weight, of polyacrylonitrile or an acrylonitrile copolymer containing at least 60% of copolymerised acrylonitrile comprising as an antistatic additive from 0.5 to 15%, by weight, of a polyether diurethane urea compound of the following general formula I



(I)

wherein

R denotes a C_8 - C_{18}-alkyl, cycloalkyl, aryl, aralkyl or alkaryl group, any of which may be substituted by halogen or alkyl;

x denotes an integer of from 5 to 50;

R′ denotes an alkylene, arylene, aralkylene, alkarylene or cycloalkylene group; and

R″ denotes hydrogen or a methyl group.

3,910,868

INCREASING INHERENT VISCOSITY OF COPOLYMERS

George A. Moczygemba, and Henry L. Hsieh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

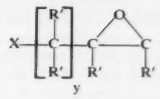
Filed Mar. 1, 1974, Ser. No. 447,426

Int. Cl.[2] C08F *27/00*

U.S. Cl. 260—89.5 S **9 Claims**

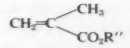
1. A method for increasing the inherent viscosity of a liquid halooxirane-methacrylate copolymer wherein the copolymer is formed from

1. a halooxirane monomer represented by the formula



wherein X is chlorine, bromine, or fluorine, *y* is an integer from 1 to 6, each R′ is hydrogen or an alkyl, cycloalkyl, or aryl radical or halogenated form thereof, each R′ can be the same or different, and the total number of carbon atoms per molecule can be about 20, and

2. a methacrylate monomer represented by the formula



wherein R″ is a linear or branched alkyl hydrocarbon radical with from about 1 to 6 carbon atoms per radical, said method comprising:

treating the copolymer in the presence of a suitable solvent with an organolithium treating agent wherein said treating agent is an organolithium compound represented by the general formula RLi_x, or a mixture of two or more said compounds, wherein x is an integer from 2 to 6, R is a hydrocarbon radical selected from the group consisting of aliphatic, cycloaliphatic, and aromatic radicals of from about 1 to 20 carbon atoms per radical, the valence of R is equal to the integer *x*.

3,910,869

CHEMICAL PROCESS

Morford C. Throckmorton, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 438,301, Jan. 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 12,902, Feb. 19, 1970, abandoned, which is a continuation of Ser. No. 617,788, Feb. 23, 1967, abandoned. This application Dec. 3, 1974, Ser. No. 529,160

Int. Cl.[2] C08D *1/14, 3/08*

U.S. Cl. 260—94.3 **7 Claims**

1. The process for the polymerization of butadiene and butadiene in mixture with other diolefins to form polymers containing at least 95% of the butadiene units in the cis-1,4 configuration which comprises contacting said monomer under solution polymerization conditions at temperatures ranging from about −10°C to about 100°C with a catalyst comprising

1. at least one compound selected from the group of
   a. trialkylaluminums and
   b. aluminum dialkylhydrides and
2. at least one organonickel compound selected from the group consisting of
   a. nickel salts of carboxylic acids,
   b. nickel acetylacetonate and
   c. nickel tetracarbonyl, and
3. hydrogen fluoride

in which the molar ratio of the compound of (1)/the compound of (2) ranges from about 2/1 to about 80/1, the mol ratio of the compound of (3)the compound of (2) ranges from about 3/1 to about 150/1 and the mol ratio of the compound of (3)/the compound of (1) ranges from about 1/1 to about 10/1 and each catalyst component (1), (2) and (3) being added to the polymerization mixture.

3,910,870

PROCESS FOR THE POLYMERIZATION OF ALPHA OLEFINS

Siegfried Lutze, Gelsenkirchen; Hans-Walter Birnkraut, Oberhausen, and Hubert Moser, Lintorf, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen-Holten, Germany

Filed Dec. 2, 1974, Ser. No. 528,738

Claims priority, application Germany, Dec. 7, 1973, 2361052

Int. Cl.[2] C08F *2/06, 4/64*

U.S. Cl. 260—94.9 B 8 Claims

1. In a process for polymerizing at least one α-olefin in which the olefin is contacted with a catalyst comprising a reduced transition metal compound and an aluminum alkyl compound, the reaction being conducted at a temperature of 0° to 250°C and under a pressure less than about 50 kgs/cm^{2}g., the improvement which comprises pretreating a compound of the transition metal in a higher valence state with a mixture of an unsaturated polymeric organoaluminum compound and an alkyl aluminum compound of the formula AlR_nX_{3-n} in which R is saturated or unsaturated, straight or branched chain alkyl having 2–4 carbon atoms, X is halogen and n is an integer from 1 to 3, thereby obtaining the reduced transition metal compound; said improved process providing a method of controlling particle size distribution in the resulting polyolefin.

3,910,871

NOVEL GLYCYLGLYCINE AMIDES

Ulf Hendrik Anders Lindberg, and Sven Bengt Arvid Akerman, both of Sodertalje, Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

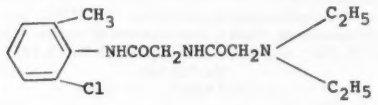
Filed Feb. 12, 1973, Ser. No. 331,899

Claims priority, application United Kingdom, Feb. 15, 1972, 006943/72

Int. Cl.[2] C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 3 Claims

1. A compound having the structural formula



or a therapeutically acceptable salt thereof.

3,910,872

HYPOCALCAEMICALLY ACTIVE PEPTIDES RELATED TO HUMAN CALCITONIN

Bernhard Riniker, Frenkendorf, and Werner Rittel, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

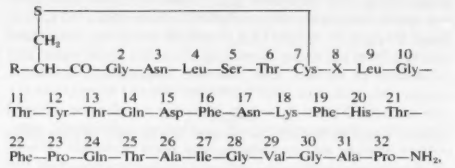
Filed Mar. 20, 1974, Ser. No. 453,148

Claims priority, application Switzerland, Mar. 28, 1973, 4454/73; Dec. 14, 1973, 17549/73

Int. Cl.[2] C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 10 Claims

1. A peptide of the formula I


S
CH2
2 3 4 5 6 7 8 9 10
R—CH—CO—Gly—Asn—Leu—Ser—Thr—Cys—X—Leu—Gly—
11 12 13 14 15 16 17 18 19 20 21
Thr—Tyr—Thr—Gln—Asp—Phe—Asn—Lys—Phe—His—Thr—
22 23 24 25 26 27 28 29 30 31 32
Phe—Pro—Gln—Thr—Ala—Ile—Gly—Val—Gly—Ala—Pro—NH2,

wherein X represents L-methionine, L-valine, L-norvaline, L-leucine, L-isoleucine, L-norleucine or L-α-aminobutyric acid radical and wherein L-alanine[26] is replaced by L-asparagine and/or L-isoleucine[27] is replaced by L-threonine and wherein, optionally, one or more of the aminoacids in positions 11, 12, 16, 19, 22 and 24 is or are replaced by another aminoacid, namely L-threonine[11] by L-lysine, L-tyrosine[12] by L-leucine, L-phenylalanine[16] by L-leucine, L-phenylalanine[19] by L-leucine, L-phenylalanine[22] by L-tyrosine and L-glutamine[24] by L-arginine, R is hydrogen, free amino or acylamino in which acyl is a lower mono-basic or dibasic alkanoyl, lower alkyloxycarbonyl, benzyloxycarbonyl, L-pyroglutanyl, carbamoyl, N-lower alkylcarbamoyl, N-phenylcarbamoyl, or N-phenylthiocarbamoyl, its acid addition salts and complexes with a member selected from the group consisting of zinc phosphate, zinc pyrophosphate and zinc hydroxide, polyhydroxy gelatine, polyphoretine phosphate, polyphosphates and polyglutamic acid.

3,910,873

PRODUCTION OF WATER-SOLUBLE POLYCARBOXYLIC LIGNIN BY AN OXYGEN-ALKALI PROCESS

Stephen Y. Lin, Mount Pleasant, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed May 30, 1974, Ser. No. 474,784

Int. Cl.[2] C07G *1/00*

U.S. Cl. 260—124 R 9 Claims

1. A process for preparing a polycarboxylic lignin which comprises,

a. dissolving an alkali lignin which is substantially free of organically bound sulfur in an aqueous solution less than 18 percent by weight of lignin,

b. adding alkali until the lignin solution contains 5 to 50 percent of alkali by weight of lignin, and

c. reacting oxygen with said alkaline solution of lignin at a temperature between about 25°C. and 200°C. and a pressure of 50 to 200 p.s.i. for a time sufficient to consume into said alkaline solution of lignin between 5 and 30 parts of oxygen per 100 parts of lignin.

3,910,874

WATER-INSOLUBLE THIAZOLE AND THIADIAZOLE AZO DYESTUFFS

Guenter Lange, deceased, late of Ludwigshafen, Germany (by Elisabeth Hedwig Lange, heiress-at-law), assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

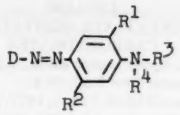
Continuation-in-part of Ser. No. 828,387, May 27, 1969, Pat. No. 3,658,784. This application May 28, 1971, Ser. No. 148,239

Claims priority, application Germany, June 1, 1968, 1769503

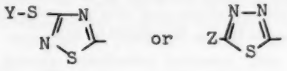
Int. Cl.[2] C09L *29/08*

U.S. Cl. 260—158 3 Claims

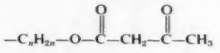
1. A dye having the formula



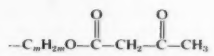
where
D is the radical of the formula



Y is methyl or carbomethoxyethyl,
Z is ethyl, phenyl or p-chlorophenyl,
R^1 is hydrogen, methyl, ethyl, methoxy or ethoxy;
R^2 is hydrogen, chlorine, methyl, ethyl, methoxy, ethoxy, acetylamino or propionylamino;
R^3 is the radical having the formula:



R^4 is the radical having the formula



or the formula $-C_mH_{2m}-X$;
n is one of the integers 2 and 3
m is one of the integers 1, 2, 3 and 4; and
X is hydrogen, hydroxy, cyano, methoxy or ethoxy.

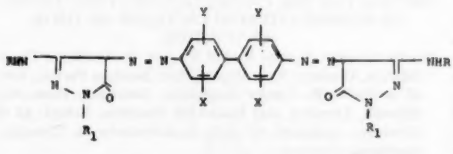
3,910,875

DISAZO COMPOUNDS CONTAINING 3-AMIDO-PYRAZOLE-5-ONE COMPONENTS

Wolfgang Rieper, Frankfurt am Main, and Joachim Ribka, Offenbach (Main), both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 5, 1973, Ser. No. 321,242
Claims priority, application Germany, Jan. 7, 1972, 2200659
Int. Cl.[2] C09B *33/12*; **D06P** *1/04*
U.S. Cl. 260—161 **6 Claims**

1. A pigment of the formula



in which X and Y are hydrogen, chlorine, bromine, alkyl of one to four carbon atoms, alkoxy of one to four carbon atoms or nitro, R is alkanoyl, alkylsulfonyl, alkylcarbamoyl or alkylthiocarbamoyl, each having one to six carbon atoms in the alkyl moiety, benzoyl, hexahydrobenzoyl, phenylacetyl, phenylsulfonyl, phenylcarbamoyl or phenylthiocarbamoyl wherein each of said benzoyl or phenyl groups may be substituted by one to three substituents selected from the group consisting of alkyl of one to four carbon atoms, alkoxy of one to four carbon atoms, chlorine, bromine and nitro, and R_1 is hydrogen, phenyl or phenyl substituted by alkyl of one to four carbon atoms, alkoxy of one to four carbon atoms, chlorine, bromine or nitro.

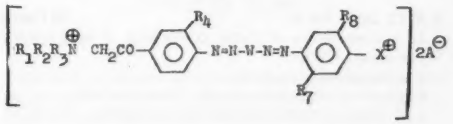
3,910,876

BISCATIONIC DISAZO DYES FOR ACID-MODIFIED NYLONS

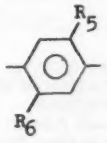
Daniel Shaw James, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 58,707, July 27, 1970, Pat. No. 3,759,893. This application May 3, 1973, Ser. No. 356,909
Int. Cl.[2] C09B *31/02*; **D06P** *3/26*
U.S. Cl. 260—191 **2 Claims**

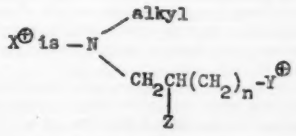
1. A biscationic disazo dye having the formula:



where
R_1 is alkyl
R_2 is alkyl or hydroxyalkyl
R_3 is alkyl, hydroxyalkyl or benzyl
R_4 is H or Cl
W is 1,4-naphthylene or



R_5 and R_6 are H, alkyl, alkoxy or Cl
R_7 is H, alkyl, alkoxy, Cl, NHCO alkyl or $NHCOC_6H_5$
R_8 is H, Cl, alkyl or alkoxy



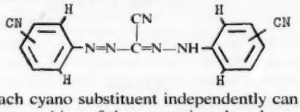
$Y^{\oplus}$ is $\overset{\oplus}{N}H_3R_9R_3$ or $NHCOCH_2\overset{\oplus}{N}R_9R_2R_3$, where R_9 is R_1 or H
n is 0 or 1
Z is H when n is 0 and OH when n is 1
$A^{\ominus}$ is anion
an where alkyl and alkoxy, each occurrence, contain 1–4 carbon atoms.

3,910,877
BIS(CYANOPHENYL)-3-FORMAZANCARBONITRILE COMPOUNDS

William W. Prichard, Hockessin, and Francis Wilfred Stacey, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1973, Ser. No. 429,026
Int. Cl.[2] C07C *107/00;* **A01N** *9/20*
U.S. Cl. 260—193 **2 Claims**

1. A compound of the formula



wherein each cyano substituent independently can be in the meta or para position of the respective phenyl moeties.

3,910,878
LATENT OXYALKYLATION CATALYSTS

Robert William McAda, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

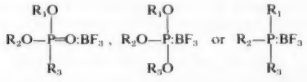
Continuation-in-part of Ser. No. 759,235, Sept. 11, 1968, Pat. No. 3,597,502. This application Mar. 25, 1971, Ser. No. 128,127
Int. Cl.[2] C07H *15/04*
U.S. Cl. 260—209 R **10 Claims**

1. A composition of matter comprising, at temperatures below about, 120°C.:

a. a vicinal alkylene oxide;

b. a hydroxy-containing organic compound; and

c. at least one compound having the formula



R_1, R_2 and R_3 are each independently aryl, aralkyl, alkaryl, alkyl, chloroalkyl or bromoalkyl of from 1 to about 8 carbon atoms, in amount sufficient to catalyze the oxyalkylation reaction between (*a*) and (*b*) at temperatures above about 120°C.

3,910,879
THERMAL STABILIZATION OF HALOGENATED POLYOLS

Allan H. Syrop, Hamden, and Pedro T. Tejera, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 8, 1974, Ser. No. 440,896
Int. Cl.[2] C07H *15/08;* **C07C** *41/00*
U.S. Cl. 260—209 R **14 Claims**

1. A halogenated polyether polyol composition containing a stabilizing proportion of turpentine, said halogenated polyether polyol being comprised of the product of reacting

a. a halogenated alkylene oxide having at least one halogen substituent, said halogen being chlorine, bromine or a mixture thereof, with

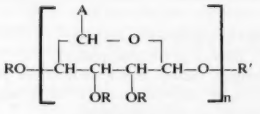
b. a polyhydroxy compound having 2–8 hydroxyl groups or an alkylene oxide condensate thereof, said polyhydroxy compound being selected from the group consisting of ethylene glycol, propylene glycol, isobutylene glycol, 2,3-butanediol, 1,4-dihydroxy-2-butane, 1,4-dihydroxycyclohexane, 2-butyne-1,4-diol, 1,12-dihydroxyoctadecane, glycerin, trimethylolpropane, sorbitol, mannitol, inositol, erythritol, pentaerythritol, sucrose, dextrose, methyl glucoside, 1,4-dimethylolbenzene, glycerin monochlorohydrin, diglycerol, methyl ether of glycerin and a mixture thereof.

3,910,880
SULFOSUCCINATE DERIVATIVES OF CARBOHYDRATES

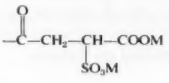
Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 222,648, Feb. 1, 1972, Pat. No. 3,756,966. This application Aug. 13, 1973, Ser. No. 387,835
Claims priority, application Germany, Sept. 28, 1971, 2148279; United Kingdom, Sept. 28, 1971, 45161/71
Int. Cl.[2] C07H *13/12;* **C08B** *3/08, 31/04*
U.S. Cl. 260—210 R **5 Claims**

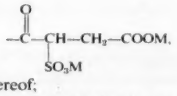
1. A sulfosuccinate derivative of a carbohydrate selected from the group consisting of an alkyl glycoside, a di-, oligo- or poly-saccharide having the general formula



wherein A is COO[H]M or CH_2OR; R is hydrogen or a sulfosuccinate moiety of the formula:

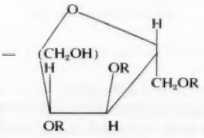


or



and mixtures thereof;

R′ is R, an alkyl group containing 1 to 4 carbon atoms or an α- or β-fructose moiety having the structure



wherein R is as defined above; M is a cation selected from the group consisting of an alkali metal, alkanol ammonium or ammonium, or mixtures thereof; *n* is an integer from about 1–10,000 and wherein the D.S. value, which represents the average number of sulfosuccinate moieties per monomeric unit, is at least 1 when *n* is 1, and at least 0.5 per monomeric unit when *n* is greater than 1.

3,910,881
METHOD FOR THE PRODUCTION OF NITRIC ESTERS OF HYDROXYSTEROID LACTONES OR THEIR GLYCOSIDES

Frieder Scheller, Berlin; Rudolf Megges, Berlin-Buch; Frank Dittrich, Dresden; Kurt Repke; Hans Joachim Portius, both of Berlin-Buch; Gunter Kammann, Radebeul; Hans-Jorg Schmidt, Dresden, and Knut-Olaf Haustein, Erfurt, all of Germany, assignors to Veb Arzneimittelwerk Dresden, Radebeul, Germany

Filed June 11, 1973, Ser. No. 369,025
Claims priority, application Germany, June 15, 1972, 165405
Int. Cl.[2] C07J *41/00*
U.S. Cl. 260—210.5 **1 Claim**

1. A compound selected from the group consisting of cyma-

ro-19-nitrate, 16-epi-gito xin-16-nitrate, gitoxin-16 -nitrate, digoxin-12-nitrate and helveticosol-19-nitrate.

3,910,882

CARDIOACTIVE ANHYDROTALOMETHYLOSIDES AND PROCESS FOR PREPARING THEM

Werner Haede, Hofheim, Taunus; Werner Fritsch, Neuenhain, Taunus; Ulrich Stache, Hofheim, Taunus, and Ernst Lindner, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

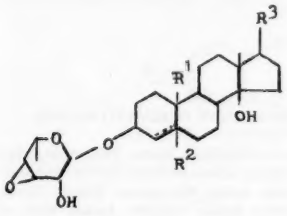
Filed July 26, 1973, Ser. No. 382,662

Claims priority, application Germany, July 28, 1972, 2237144

Int. Cl.[2] C07J *19/00*

U.S. Cl. 260—210.5 **4 Claims**

1. A 3′, 4′-anhydro-α-L-talomethyloside of the formula I



I

wherein R^1 is methyl or formyl, R^2 stands for β—H or β—OH, if there is no double bond in 4,5-position, and R^3 is a butenolide or cumalin ring.

3,910,883

S-SUBSTITUTED-2-THIOADENOSINES AND PROCESS FOR PRODUCING THE SAME

Kiyomi Kikugawa; Hideo Suehiro, both of Kokubunji; Leiko Sugata, Saiki; Motonobu Ichino, and Tokuro Nakamura, both of Mitaka, all of Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

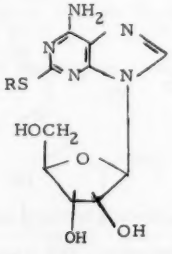
Filed July 10, 1973, Ser. No. 378,117

Claims priority, application Japan, Jan. 29, 1973, 48-11159

Int. Cl.[2] C07H *19/16*

U.S. Cl. 260—211.5 R **13 Claims**

1. S-substituted-2-thioadenosines represented by the following general formula:



wherein R is selected from the group consisting of an alkyl group having five to 10 carbon atoms, a cycloalkyl group having five to 7 carbon atoms and a cyclohexylmethyl group.

3,910,884

S-SUBSTITUTED-2-THIOADENOSINES AND PROCESS FOR PRODUCING THE SAME

Kiyomi Kikugawa; Hideo Suehiro; Kazuhiro Iizuka; Leiko Sugata; Motonobu Ichino, and Tokuro Nakamura, all of Saiki, Japan, assignors to Kohjin Co., Ltd., Shimba, Japan

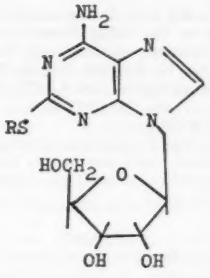
Filed June 19, 1973, Ser. No. 371,340

Claims priority, application Japan, June 19, 1972, 47-60464

Int. Cl.[2] C07H *19/16*

U.S. Cl. 260—211.5 R **8 Claims**

1. S-substituted-2-thioadenosine represented by the following general formula:



wherein R is selected from the group consisting of an allyl group, a β or γ-methallyl group, a benzyl group, a p-nitro or p-chlorobenzyl group and a diethylaminoethyl group.

3,910,885

4-ALKOXY NUCLEOSIDES AND INTERMEDIATES THEREFORE

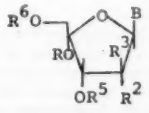
John G. Moffatt, and Julien P. H. Verheyden, both of Los Altos, Calif., assignors to Syntex (U.S.A) Inc., Palo Alto, Calif.

Filed Mar. 12, 1974, Ser. No. 450,350

Int. Cl.[2] C07H *19/06, 19/00*

U.S. Cl. 260—211.5 R **20 Claims**

1. A compound selected from the group of compounds represented by the formula:



wherein

B is a pyrimidine or purine base selected from the group consisting of uracil-1-yl, 5-fluorouracil-1-yl, 5-alkyluracil-1-yl, 5-trifluoromethyluracil-1-yl, 5-nitrouracil-1-yl, 5-methylaminouracil-1-yl, 5-dimethylaminouracil-1-yl, 6-aza-uracil-1-yl, 6-aza-5methyluracil-1-yl, cytosin-1-yl, 5-fluorocytosin-1-yl, 5-alkylcytosin-1-yl, 5-trifluoromethylcytosin-1-yl, 5-nitrocytosin-1-yl, 5-methylaminocytosin-1-yl, 5-dimethylaminocytosin-1-yl, 6-azacytosin-1-yl, adenin-9-yl, 2-fluoroadenin-9-yl, 2-azaadenin-9-yl, 7-deazaadenin-9-yl, 8-azaadenin-9-yl, 8-aza-9-deazaadenin-9-yl, 7-deaza-7-cyanoadenin-9-yl, N^6-methyladenin-9-yl, N^6-dimethyladenin-9-yl, guanin-9-yl, 8-azaguanin-9-yl, 7-deazaguanin-9-yl, isoguanin-9-yl, hypoxanthin-9-yl and xanthin-9-yl, and hydrolyzable acyl derivatives thereof derived from a carboxylic acid having from 1 to 12 carbon atoms and wherein alkyl refers to a straight chain hydrocarbon group containing 1 to 5 carbon atoms;

R is methyl, ethyl, $-CH_2CH_2X$, $-CH_2CH(X)_2$ or $-CH_2C(X)_3$ and each X is Cl or F;
one of R^2 and R^3 is hydrogen and the other is hydrogen or OR^4; and
each of R^4, R^5 and R^6 are hydrogen or a hydrolyzable acyl group having 1 to 12 carbon atoms;
provided that when both R^2 and R^3 are hydrogen, B is a pyrimidine base.

3,910,886

ORGANO-PHOSPHORUS COMPOUNDS CONTAINING PERFLUOROALKYL RADICALS AND AZIRIDINE RADICALS

Leon H. Chance, and Jerry P. Moreau, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 843,200, July 18, 1969, Pat. No. 3,639,144. This application June 9, 1971, Ser. No. 151,507

Int. Cl.[2] C07F *9/56*

U.S. Cl. 260—239 EP **1 Claim**

1. 1-(1H,1H-perfluorooctyl)-1,3-trimethylenebin[di(1-aziridinyl)phosphine oxide] substantially free of 1H, 1H, 2H, 2H-perfluorononylbis(1-aziridinyl)phosphine oxide.

3,910,887

AZABENZO-1,5-DIAZEPINES

Walter Von Bebenburg, Buchschlag, Germany, assignor to Deutsche Gold- und Silber-Schneideanstalt vormals Roessler, Germany

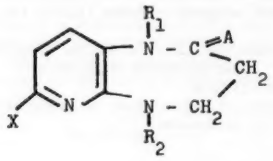
Continuation-in-part of Ser. No. 330,108, Feb. 6, 1973, abandoned. This application Aug. 12, 1974, Ser. No. 497,119

Claims priority, application Australia, Dec. 7, 1972, 10442/72

Int. Cl.[2] C07D *471/04*

U.S. Cl. 260—239.3 B **16 Claims**

1. An azabenzo-1,5-diazepine of the formula



where X is halogen of atomic weight 9 to 80, R_1 is hydrogen, alkyl of 1 to 6 carbon atoms or alkyl of 1 to 6 carbon atoms having an omega dimethylamino or diethylamino substituent, R_2 is phenyl or phenyl having one halogen substituent of atomic weight 9 to 80, A is oxygen, sulfur, or alkylimino having 1 to 6 carbon atoms in the alkyl group, or the tautomeric forms of such compounds or salts of such compounds with pharmacologically acceptable acids.

3,910,888

CHOLERETICALLY ACTIVE ESTERS AND SALTS OF BILE ACIDS

Josef Olav Widauer, Allschwil, Switzerland; Konrad Lang, Bad Krozingen, Germany; Laszlo Baum, and Suzanne Szabo, both of La Tour-de-Peilz, Switzerland, assignors to Medichemie A.G., Basel, Switzerland

Division of Ser. No. 272,156, July 17, 1972, Pat. No. 3,846,411. This application July 29, 1974, Ser. No. 492,713

Claims priority, application Switzerland, Aug. 4, 1971, 11484/71; Sept. 28, 1971, 14085/71; Jan. 24, 1972, 1012/72

Int. Cl.[2] C07J *17/00*

U.S. Cl. 260—239.5 **3 Claims**

1. Choleretically active salts of bile acids esters of the general formula

A—COO—Alk—NR_1R_2.HOOC—B I

or

A—COOH.R_2R_1N—Alk—OOC—B II

in which A—COO— is the rest of a bile acid; B—COO— the rest of an other acid which cooperates choleretically with a bile acid; Alk is an ethylene, propylene or isopropylene group, and R_1 and R_2, which are identical of different, represent a hydrogen atom or a lower alkyl group or together with the nitrogen atom form a heterocyclic ring which can contain another nitrogen or oxygen atom and which can be substituted with alkyl groups provided that when the salt of formula I is selected, said other acid is not cinnamic acid.

3,910,889

NOVEL BENZODIAZEPINE DERIVATIVES AND PREPARATION THEREOF

Mitsuhiro Akatsu, Ikeda; Yoshiharu Kume, Takarazuka; Toshiyuki Hirohashi, Ashiya; Kikuo Ishizumi, Ikeda; Michihiro Yamamoto, Toyonaka; Isamu Maruyama, Minoo; Kazuo Mori, Kobe; Takahiro Izumi; Shigeho Inaba, both of Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

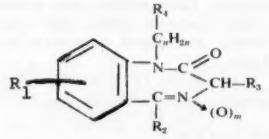
Filed Aug. 20, 1971, Ser. No. 173,701

Claims priority, application Japan, Aug. 31, 1970, 45-76544; Aug. 31, 1970, 45-76545; Sept. 2, 1970, 45-77323The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.

Int. Cl.[2] C07D *243/30, 243/36, 243/24*

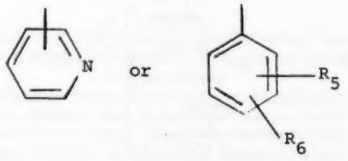
U.S. Cl. 260—239.3 D **10 Claims**

1. A compound of the formula



wherein R_1 represents hydrogen, halogen, nitro, C_{1-4} alkoxy, cyano or trifluoromethyl;

R_2 represents a group of the formula



wherein R_5 and R_6 represent hydrogen, halogen, C_{1-4} alkyl or trifluoromethyl;

R_3 represents hydrogen, C_{1-4} alkyl or unsubstituted or halogen- or C_{1-4} alkyl-substituted phenyl-C_{1-2}-alkyl;

R_4 represents tetrahydropyranyloxy;

m represents zero or 1; and *n* represents an integer of 1 to 4; and acid addition salts thereof.

3,910,890

PREPARATION OF MORPHANTHRIDIN-6-(5H)-ONES

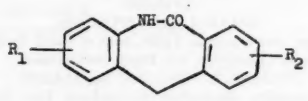
Jerome Linder, Westfield, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 299,216, Oct. 20, 1972, abandoned. This application Sept. 14, 1973, Ser. No. 397,228

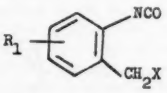
Int. Cl.[2] C07D *223/20*

U.S. Cl. 260—239.3 T 7 Claims

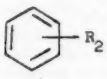
1. A process for preparing a compound of the formula



which comprises treating a compound of the formula



with a compound of the formula



in an inert solvent and in the presence of a Friedel Crafts catalyst, where

X is halo having an atomic weight of between 35 to 80 and R_1 and R_2 each independently represent hydrogen, halo having an atomic weight of between 19 to 80 lower alkyl.

3,910,891

SEPARATION OF α-AMINO-ω-LACTAMS FROM BECKMANN REARRANGEMENT MIXTURES

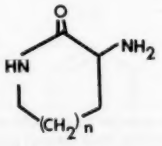
Josefina T. Baker, Mount Tabor; Robert Fuhrmann, Morris Plains; Fred W. Koff, Long Valley, and John Pisanchyn, Morristown, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed June 6, 1974, Ser. No. 477,131

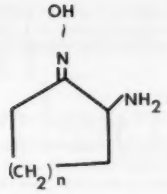
Int. Cl.[2] C07D *223/12, 207/14, 211/56*

U.S. Cl. 260—239.3 R 14 Claims

1. A process for separating an α-amino-ω-lactam of the formula:



wherein *n* is an integer from 0 to 12 in its free form from the rearranged mixture obtained by the Backmann rearrangement of an α-aminocycloalkanone oxime of the formula



wherein *n* has the meaning given above, which process comprises the steps of

contacting said rearranged mixture with a solvent selected from the group consisting of

a. linear and cyclic ethers and polyethers;

b. C_3 to C_8 alcohols, in the absence of chloride ions;

c. nitriles containing two or more carbon atoms;

d. aromatics and haloaromatics in the presence of at least one of said (a) or (b), wherein the halo-substituent is chlorine or bromine attached directly to the aromatic ring;

e. chloroform;

f. trichloroethylene in the presence of at least one of said (a) or (b), and

g. mixtures of two or more of the above, while simultaneously neutralizing the resultant solution with an excess of anhydrous ammonia based on the hydrogen ion concentration in said solution, whereby an insoluble precipitate is formed; and

separating said solution containing said α-amino-ω-lactam in its free form from said precipitate.

12. The process of claim 3 including the further step of recovering said α-amino-ε-caprolactam from said α-amino-ε-caprolactam containing solution.

3,910,892

BENZODIOXANE DERIVATIVES

Madhukar Subraya Chonekar, Basel; Albert Pfiffner, Pfaffhausen; Norbert Rigassi, Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Pfaffhausen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

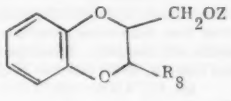
Division of Ser. No. 235,000, March 15, 1972, Pat. No. 3,819,655. This application Apr. 3, 1974, Ser. No. 457,516

Claims priority, application Switzerland, Mar. 23, 1971, 4258/71

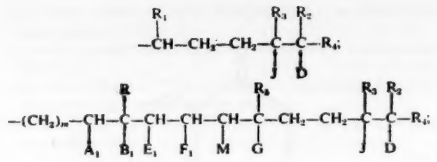
Int. Cl.[2] C07D *319/20*

U.S. Cl. 260—240 R 11 Claims

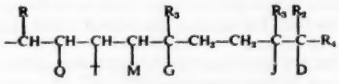
1. A compound of the formula:



wherein R_8 is hydrogen or lower alkyl and Z is:



and



wherein R, R_1 and R_3 are hydrogen or lower alkyl; R_2, R_4 and R_5 are lower alkyl; D is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkenyloxy, lower alkynyloxy or lower alkanoyloxy; J is hydrogen or taken together with D forms a carbon to carbon bond or an oxygen bridge; M, T and Q are individually hydrogen; G is individually hydrogen or lower alkoxy, with M taken together with G and Q taken together with T forming a carbon to carbon bond; A_1 and B_1 are individually hydrogen or taken together form a carbon to carbon bond; E_1 and F_1 are individually hydrogen or when A_1 and B_1 taken toether form a carbon to carbon bond, E_1 and F_1 are individually hydrogen, or taken together form a carbon to carbon bond and m is an integer from 1 to 2.

3,910,893

BENZODIOXANE DERIVATIVES

Madhukar Subraya Chodnekar, Basel; Albert Pfiffner, Pfaffhausen; Norbert Rigassi, Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Pfaffhausen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

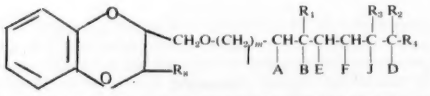
Division of Ser. No. 235,000, March 13, 1972, Pat. No. 3,819,655. This application Feb. 19, 1974, Ser. No. 443,588

Claims priority, application Switzerland, Mar. 23, 1971, 4258/71

Int. Cl.[2] C07D *319/20*

U.S. Cl. 260—240 R **24 Claims**

1. A compound of the formula:



wherein R_1, R_3 and R_8 are hydrogen or lower alkyl; R_2 is lower alkyl; A is hydrogen, B is hydrogen, lower alkoxy or taken together with A forms a carbon to carbon bond or an oxygen bridge; D is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkenyloxy, lower alkynyloxy or lower alkanoyloxy; J is hydrogen or taken together with D forms a carbon to carbon bond or an oxygen bridge; E and F are hydrogen or when A and B taken together form a carbon to carbon bond, E and F are individually hydrogen or taken together form a carbon to carbon bond; m is an integer from 1 to 2.

3,910,894

INSECT HORMONE MIMICS

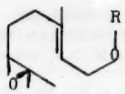
Edward Koon Wah Wat, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 14, 1970, Ser. No. 37,352

Int. Cl.[2] C07D *308/28*

U.S. Cl. 260—240 H **3 Claims**

1. A compound having the formula



wherein R is 3- or 4- monosubstituted cyclohexyl in which the substituent is alkyl or alkoxy of 1 to 3 carbon atoms.

3,910,895

TRIAZOLE COMPOUNDS

Kurt Weber, and Christian Lüthi, both of Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

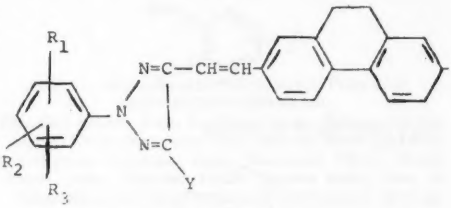
Filed Dec. 12, 1972, Ser. No. 314,488

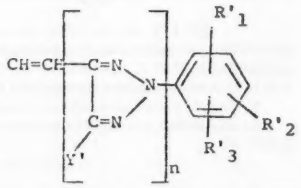
Claims priority, application Switzerland, Dec. 30, 1971, 19174/71

Int. Cl. C07d *249/04*, *249/06*

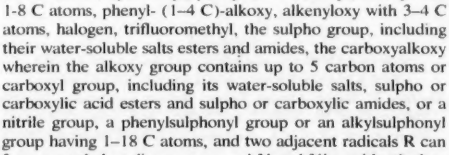
U.S. Cl. 260—240 D **6 Claims**

1. A triazole derivative corresponding to the formula





wherein R_1, R'_1, R_2, R'_2, R_3 and R'_3 are identical or different and denote hydrogen, alkyl with 1–12 C atoms, alkenyl with 3–4 C atoms, cyclohexyl, phenyl-(1–4 C)-alkyl, alkoxy with 1-8 C atoms, phenyl- (1–4 C)-alkoxy, alkenyloxy with 3–4 C atoms, halogen, trifluoromethyl, the sulpho group, including their water-soluble salts esters and amides, the carboxyalkoxy wherein the alkoxy group contains up to 5 carbon atoms or carboxyl group, including its water-soluble salts, sulpho or carboxylic acid esters and sulpho or carboxylic amides, or a nitrile group, a phenylsulphonyl group or an alkylsulphonyl group having 1–18 C atoms, and two adjacent radicals R can form a methylenedioxy group and Y and Y′ are identical or different and represent hydrogen, methyl, halogen or a radical



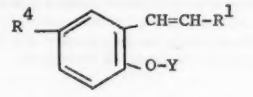
and *n* represents the number 0 or 1, said sulpho or carboxylic acid esters being alkyl esters or alkenyl esters having up to 18 carbon atoms or phenyl esters, and said sulpho or carboxylic acid amides being unsubstituted amides, alkylamides, hydroxyalkylamides or cycloalkylamides having up to 18 carbon atoms, phenylamide or morpholide.

3,910,896
SUBSTITUTED PHENOXYALKYLAMINES AS GASTRIC ANTI-SECRETORY AGENTS

Peter E. Cross, Canterbury; James R. Stichbury, Harbledown, near Canterbury; Eric F. Thorpe, Birchington, all of England, and Neil M. Scollick, New London, Conn., assignors to Pfizer Inc., New York, N.Y.

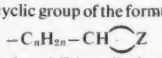
Division of Ser. No. 122,253, March 8, 1971, Pat. No. 3,751,470. This application Mar. 23, 1973, Ser. No. 344,426
Claims priority, application United Kingdom, Mar. 13, 1970, 12111/70
Int. Cl.[2] C09B *23/00*
U.S. Cl. 260—240 R **5 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable acid addition salts thereof wherein R^1 is alkyl or cycloalkyl of from 5 to 8 carbon atoms; Y is aminoalkyl of the formula —Alk—NR^2R^3, in which R^2 and R^3 taken together with the nitrogen atom to which they are attached form a pyrrolidino, piperidino, morpholino, thiomorpholino, piperazino, azepino or diazepino group and 'Alk' represents a divalent alkyl group containing from 2 to 4 carbon atoms, the free valences being located on different carbon atoms;

or Y is an amino-cyclic group of the formula



which n is 0 to 3 and Z is a divalent group which completes a pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine, azepine or diazepine ring, the nitrogen atom in said ring being separated from the oxygen atom to which the aminocyclic group is attached, by a chain of from 2 to 4 carbon atoms;

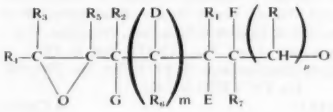
and R^4 is hydrogen, halogen, lower alkyl or lower alkoxy.

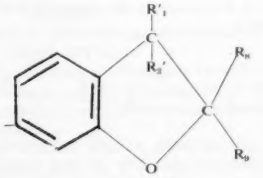
3,910,897
PEST RETARDANTS

Madhukar Subraya Chodnekar, Basel; Peter Loeliger; Albert Pfiffner, both of Pfaffhausen; Ulrich Schwieter, Reinach; Milos Suchy, and Rene Zurflueh, both of Pfaffhausen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 16, 1973, Ser. No. 351,215
Claims priority, application Switzerland, Apr. 21, 1972, 5929/72; Mar. 2, 1973, 3100/73
Int. Cl.[2] C07D *303/12*
U.S. Cl. 260—240 H **11 Claims**

1. A compound of the formula:





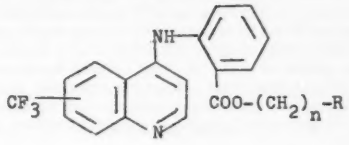
wherein R, R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_1' and R_2' are hydrogen or lower alkyl; G and D are individually hydrogen or taken together form a carbon to carbon bond; E and F are individually hydrogen or taken together form a carbon to carbon bond; m is an integer of from 0 to 1; and p is an integer from 1 to 2.

3,910,898
NOVEL TRIFLUOROMETHYL-QUINOLINES

Andre Allais, Les Lilas, and Jean Meier, La Varenne Saint-Hilaire, both of France, assignors to Roussel-UCLAF, Paris, France

Continuation-in-part of Ser. No. 830,148, June 3, 1969. This application Apr. 3, 1974, Ser. No. 457,604
Claims priority, application France, Apr. 18, 1973, 73.14132; Nov. 8, 1968, 68.173099
Int. Cl.[2] C07D *295/04*
U.S. Cl. 260—247.2 B **3 Claims**

1. A compound selected from the group consisting of 7- and 8-trifluoromethyl-quinolines of the formula



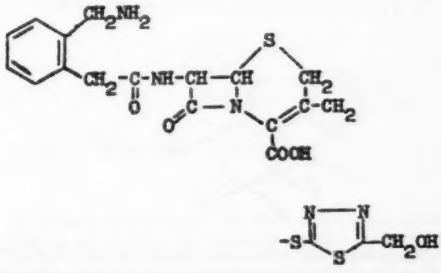
wherein n is 1 or 2 and R is morpholino and their non-toxic, pharmaceutically acceptable acid addition salts.

3,910,899
7-(2-AMINOMETHYLPHENYL-ACETAMIDO)-3-[2-(5-HYDROXYMETHYL-1,3,4-THIADIAZOLYL)-THIOMETHYL]-3-CEPHEM-4-CARBOXYLIC ACID

William J. Gottstein, Fayetteville; Murray A. Kaplan, Syracuse, and Alphonse P. Granatek, Baldwinsville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Sept. 7, 1973, Ser. No. 395,102
Int. Cl.[2] C07D *501/22*
U.S. Cl. 260—243 C **5 Claims**

1. The acid having the formula

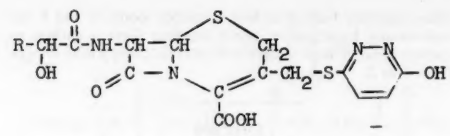


3,910,900
7-(D-α-HYDROXY-2-ARYLACETAMIDO)-3-(3-HYDROXYPYRIDAZIN-6-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACIDS

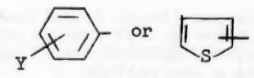
Takayuki Naito, Tokyo; Jun Okumura, and Hajime Kamachi, both of Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed May 24, 1974, Ser. No. 473,021
Int. Cl.[2] C07D *501/24*
U.S. Cl. 260—243 C **54 Claims**

1. An acid having the D configuration in the 7-sidechain and the formula



wherein R is



and Y is hydrogen, chlorine, bromine, fluorine, trifluoromethyl, amino, nitro, hydroxy, lower alkyl of 1–4 carbon atoms or lower alkoxy of 1–4 carbon atoms.

3,910,901

OXAZINOINDOLE- AND THIAZINOINDOLE DERIVATIVES

Christopher A. Demerson; Leslie G. Humber; George Santroch; Thomas A. Dobson, and Ivo Jirkovsky, all of Montreal, Canada, assignors to Ayerst, McKenna and Harrison Ltd., Montreal, Canada

Division of Ser. No. 226,287, Feb. 14, 1972, Pat. No. 3,833,575. This application June 19, 1974, Ser. No. 480,997

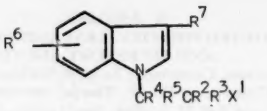
Int. Cl.[2] C07D *279/14*, *265/28*

U.S. Cl. 260—243 R **22 Claims**

1. A process for preparing a compound of formula I

I.

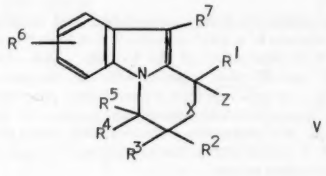
in which R^1 is lower alkyl or lower cycloalkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen or lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo; R^7 is lower alkyl; X is oxy or thio; Alk^3 is CH_2 or Alk^1—CH_2 wherein Alk^1 is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14} and R^{15} are hydrogen or lower alkyl; and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 and R^9 together with the nitrogen atom to which they are joined form a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, piperazino, 4-(lower alkyl)-1-piperazinyl and 4-[hydroxy(-lower)alkyl]-1-piperazinyl, which comprises treating a compound of formula III



III

in which R^2, R^3, R^4, R^5, R^6 and R^7 are as defined herein and X^1 is hydroxy or mercapto, with a compound of formula

in which R^1 is lower alkyl or lower cycloalkyl and Z is $COOR^{18}$ or Alk^1—$COOR^{18}$ in which R^{18} is hydrogen or lower alkyl and Alk^1 is as defined herein, in the presence of a Friedel-Crafts catalyst, to obtain a compound of formula V



V

in which R^1, R^2, R^3, R^4, R^5, R^6, R^7, Z and X are as defined herein, subjecting the compound of formula V to hydrolysis to give the corresponding acid when R^{18} of the compound of formula V is lower alkyl, converting the acid to a mixed anhydride, reacting the mixed anhydride with an appropriate amine of formula NHR^8R^9 in which R^8 and R^9 are as defined therein to give the corresponding amide, and reducing the amide with a suitable complex metal hydride selected from the group consisting of lithium aluminum hydride, lithium aluminum hydride-aluminum chloride, aluminum hydride-aluminum chloride, diborane and sodium borohydride-aluminum chloride, to give the compound of formula I.

3,910,902

METHOD FOR PREPARING 7-SUBSTITUTED CEPHALOSPORINS BY REPLACEMENT OF OXYGEN CONTAINING GROUPS

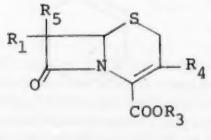
Joseph Edward Dolfini, Princeton; William A. Slusarchyk, Belle Mead, and William Henry Koster, Pennington, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 312,471, Dec. 6, 1972, abandoned. This application Sept. 6, 1973, Ser. No. 394,944

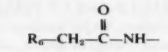
Int. Cl.[2] C07D *501/02*

U.S. Cl. 260—243 C **8 Claims**

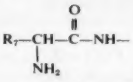
1. A process for the preparation of compounds of the formula:



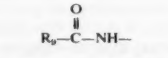
wherein R_1 is selected from the group consisting of phthalimido, benzalimino, substituted benzalimino,



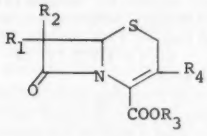
wherein R_6 is selected from the group consisting of phenyl, substituted phenyl, 1,4-cyclohexadienyl, phenoxy, substituted phenoxy thienyl, furyl, phenylthio and substituted phenylthio,



wherein R_7 is selected from the group consisting of phenyl, substituted phenyl, and 1,4-cyclohexadienyl, and



wherein R_9 is selected from the group consisting of lower alkyl, phenyl and substituted phenyl, and wherein said benzalimino, phenyl, phenoxy, or phenylthio substituent is one or two members selected from the group consisting of lower alkyl, lower alkoxy, nitro, chloro, fluoro and trifluoromethyl; R_3 is selected from the group consisting of hydrogen, t-butyl, trichloroethyl, trimethylsilyl, p-methoxybenzyl, and a cation; R_4 is selected from the group consisting of methyl, acetoxymethyl, and carbamoyloxymethyl; and R_5 is selected from the group consisting of lower alkoxy, phenoxy, lower alkanoyloxy, amino, lower alkylamino, lower dialkylamino, and azido; which comprises reacting a compound of the formula



wherein R_2 is selected from the group consisting of lower alkanoyloxy and benzoyloxy; with a compound selected from the group consisting of a lower alkyl alcohol, phenol, lower alkanoic acid or its mercury or silver salt, sodium azide, potassium azide, ammonia, lower alkylamine, and lower dialkylamine at a temperature of from about −10°C to about 110°C in the presence of an effective catalytic amount of a catalyst selected from the group consisting of mercuric acetate, mercuric chloride, dimethoxy mercury, thallium acetate, silver tetrafluoroborate, silver acetate, and lead acetate.

3,910,903

OXAZINOINDOLE- AND THIAZINOINDOLE DERIVATIVES

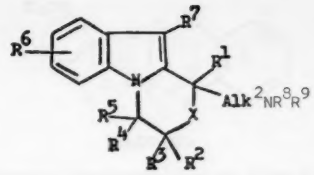
Christopher A. Demerson; Leslie G. Humber; George Santroch; Thomas A. Dobson, and Ivo Jirkovsky, all of Montreal, Canada, assignors to Ayerst, McKenna and Harrison Ltd., Montreal, Canada

Division of Ser. No. 226,287, Feb. 14, 1974, Pat. No. 3,833,575. This application June 19, 1974, Ser. No. 480,998

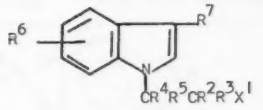
Int. Cl.[2] C07D *279/14, 265/28*

U.S. Cl. 260—243 R **20 Claims**

1. A process for preparing a compound of formula I

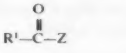


in which R^1 is lower alkyl or lower cycloalkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen or lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo; R^7 is lower alkyl; X is oxy or thio; Alk^2 is an alkylene selected from the group consisting of $CR^{10}R^{11}CHR^{12}$, $CR^{10}R^{11}CR^{12}R^{13}CHR^{14}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CHR^{16}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, and R^{16} are hydrogen or lower alkyl; and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 and R^9 together with the nitrogen atom to which they are joined form a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, piperazino, 4-(lower alkyl)-1-piperazinyl and 4-[hydroxy(lower)alkyl]-1-piperazinyl, which comprises treating a compound of formula III

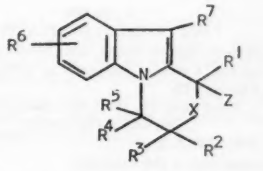


III

in which R^2, R^3, R^4, R^5, R^6 and R^7 are as defined herein and X^1 is hydroxy or mercapto, with a compound of formula



in which R^1 is lower alkyl or lower cycloalkyl and Z is Alk^2-L in which Alk^2 is as defined herein and L is halo, in the presence of a Friedel-Crafts catalyst, to obtain a compound of formula V



V

in which R^1, R^2, R^3, R^4, R^5, R^6, R^7, Z and X are as defined herein, and reacting the compound of formula V with an amine of formula HNR^8R^9 in which R^8 and R^9 are as defined herein to give the corresponding compound of formula I.

3,910,904

2-SUBSTITUTED METHYLENE-3,4-DIHYDRO-3-OXO-2H-1,4-BENZOTHIAZINE-4-ACETIC ACID AND ESTERS THEREOF

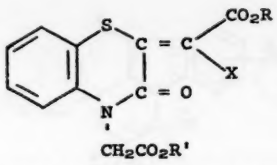
Jimmy Weldon Worley, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 12, 1974, Ser. No. 496,507

Int. Cl.[2] C07D *279/16*

U.S. Cl. 260—243 R **10 Claims**

1. A compound of the formula



wherein R and R′ are each independently hydrogen or alkyl of up to 3 carbon atoms, and X is hydrogen or -CO_2R.

3,910,905

PHOSPHORUS DERIVATIVES OF 1,2,4,5-TETRAHYDROXY BENZENE

Lothar G. Dulog, Sint Martens Latem, and Sylvain A. R. Dewaele, Evergem, both of Belgium, assignors to s.a. Texaco Belgium n.v., Brussels, Belgium

Division of Ser. No. 250,712, May 5, 1972, Pat. No. 3,819,748. This application Jan. 7, 1974, Ser. No. 431,250

Int. Cl.[2] C07D *295/16*

U.S. Cl. 260—246 B **3 Claims**

1. A compound of the formula:

wherein:

X represents pyrrolidino, piperidino or morpholino; Z is oxygen, sulfur or is absent.

3,910,906

CHELOCARDIN DERIVATIVES

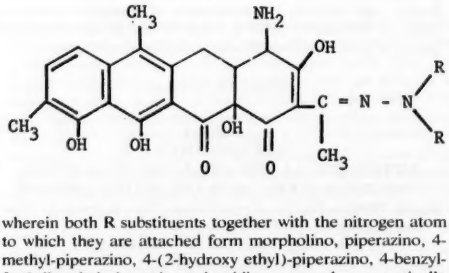
Edith Bernstein; Makoto Inaba, and David Lyon Garmaise, all of Montreal, Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Filed June 18, 1973, Ser. No. 371,104

Int. Cl.[2] C07D *295/22*

U.S. Cl. 260—247.5 R **3 Claims**

1. A compound of the formula:



wherein both R substituents together with the nitrogen atom to which they are attached form morpholino, piperazino, 4-methyl-piperazino, 4-(2-hydroxy ethyl)-piperazino, 4-benzyl-2, 6-dimethyl-piperazino, piperidino; or a pharmaceutically acceptable acid addition salt thereof.

3,910,907

PYRAZOLO(1,5-A)-1,3,5-TRIAZINES

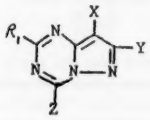
Darrell E. O'Brien, Mission Viejo; Keitaro Senga, Santa Ana, and Thomas Novinson, Newport Beach, all of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Filed July 9, 1973, Ser. No. 377,444

Int. Cl.[2] C07D *251/72*

U.S. Cl. 260—248 NS **43 Claims**

1. A compound of the structure:



wherein R_1 may be CH_3, C_2H_5 or C_6H_5; X may be H,C_6H_5, (m)CH_3-C_6H_4, CN, COOEt, Cl, I or Br; Y may be C_6H_5, (o)CH_3-C_6H_4, (p) CH_3O-C_6H_4 or H; and Z may be OH, H, CH_3, C_2H_5, C_6H_5,n-C_3H_7, ixo-C_3H_7, SH, SCH_3, NH(n-C_4H_9) or $N(C_2H_5)_2$.

3,910,908

TRIGLYCIDYL ISOCYANURATE PREPARATION

Herbert P. Price, Louisville, Ky., assignor to Celanese Coatings & Specialties Company, Jeffersontown, Ky.

Filed May 17, 1965, Ser. No. 456,549

Int. Cl.[2] C07D *251/34*

U.S. Cl. 260—248 NS **7 Claims**

1. In a process for preparing triglycidyl isocyanurate which comprises reacting cyanuric acid and epichlorohydrin in the proportions of at least 9 mols of epichlorohydrin per mol of cyanuric acid using as a catalyst a tertiary amine or a quaternary ammonium compound, wherein said catalyst contains no groups reactive with epoxide groups other than tertiary amine and quaternary ammonium groups, to form the trichlorohydrin derivative of cyanuric acid, and dehydrohalogenating the chlorohydrin derivative while dissolved in the excess epichlorohydrin with an alkali metal hydroxide, the improvement which comprises introducing the alkali metal hydroxide into the reaction medium as a dispersion having a particle size of about 1 to about 100 microns in an organic medium, wherein the organic medium is substantially non-reactive with the alkali metal hydroxide and is substantially a non-solvent for the alkali metal hydroxide.

3,910,909

PROCESS FOR THE PREPARATION OF 1,2,4-TRIAZIN-5-ONE COMPOUNDS

Wilfried Draber, Wuppertal-Elberfeld; Karlfried Dickore, Leverkusen, and Helmut Timmler, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

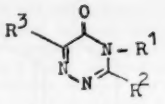
Filed July 18, 1972, Ser. No. 272,921

Claims priority, application Germany, July 29, 1971, 2138031

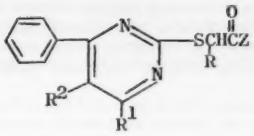
Int. Cl.[2] C07D *253/06*

U.S. Cl. 260—248 AS **15 Claims**

15. 1,2,4-Triazine-5-one compound of the formula:



(Ia)



in which

R^1 is hydrogen, hydroxyl, straight-chain or branched alkyl with up to 6 carbon atoms, which may be substituted by hydroxyl or alkoxy of from 1 to 4 carbon atoms; straight-chain or branched alkenyl or alkynyl with in either case up to 6 carbon atoms, cycloalkyl with 3 to 6 carbon atoms; straight-chain or branched alkoxy with 1 to 4 carbon atoms; aralkyl of from 1 to 2 carbon atoms in the alkyl moiety and 6 to 10 carbon atoms in the aryl moiety, which aralkyl may be substituted by an alkyl, alkoxy or alkylthio radical of from 1 to 4 carbon atoms;

R^2 is hydrogen, straight-chain or branched alkyl of from 1 to 6 carbon atoms, which may be substituted by hydroxyl, cyano or an alkoxy or alkylthio group of from 1 to 4 carbon atoms; straight-chain or branched alkenyl of from 2 to 6 carbon atoms; straight-chain or branched alkenyl of from 2 to 6 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, aralkyl of from 1 to 2 carbon atoms in the alkyl moiety and 6 to 10 carbon atoms in the aryl moiety, which aralkyl may be substituted by hydroxyl, an alkyl, alkoxy or haloalkyl radical of from 1 to 4 carbon atoms or halogen, or aryl of from 6 to 10 carbon atoms, which may be substituted by halogen, alkyl, alkoxy, hydroxyl, or trifluoromethyl; and

R^3 is unsubstituted straight-chain or branched alkyl of from 1 to 12 carbon atoms, alkyl of from 1 to 6 carbon atoms substituted by an alkoxy or alkylthio group of from 1 to 4 carbon atoms, by aryloxy of from 6 to 10 carbon atoms or by alkoxycarbonyl of from 1 to 3 carbonyl of from 1 to 3 carbon atoms in the alkyl moiety, straight-chain or branched alkenyl of from 2 to 12 carbon atoms, cycloalkyl of from 3 to 10 carbon atoms; aryl of from 6 to 10 carbon atoms or aralkyl of from 1 to 3 carbon atoms in the alkyl moiety and 6 to 10 carbon atoms in the aryl moiety wherein the two last-mentioned radicals R^3 may carry on the aryl radical one or more substituents selected from straight-chain or branched alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, alkylthio of from 1 to 4 carbon atoms, halogen, dialkylamino of from 2 to 6 carbon atoms in each alkyl radical, cyano or thiocyano.

3,910,910

(2-PYRIMIDINYLTHIO) ALKANOIC ACIDS, ESTERS, AMIDES AND HYDRAZIDES

Arthur A. Santilli, Havertown; Anthony C. Scotese, King of Prussia, and Rudolph M. Tomarelli, Phoenixville, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 240,266, March 31, 1972, Pat. No. 3,814,761. This application Oct. 24, 1973, Ser. No. 409,352

Int. Cl.[2] C07D *51/18*

U.S. Cl. 260—251 R **3 Claims**

1. A compound of the formula:

in which

R is -H or methyl;

R^1 is halo or lower alkoxy;

R^2 is -H or methyl;

Z is hydroxy, lower alkoxy, -OM or $-(NH)_pNH_2$, wherein p is 0 or 1, and M is an alkali metal cation, an alkaline earth metal cation or the ammonium ion.

3,910,911

PRODUCTION OF QUINAZOLINONE COMPOUNDS

Kikuo Ishizumi, Ikeda; Kazuo Mori, Kobe; Michihiro Yamamoto, Nishinomiya; Masao Koshiba; Shigeho Inaba, both of Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

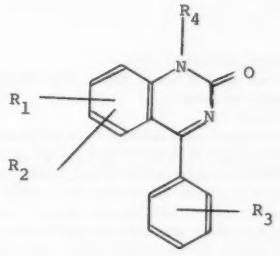
Filed July 12, 1973, Ser. No. 378,555

Claims priority, application Japan, July 20, 1972, 47-73250

Int. Cl.[2] C07D *239/82*

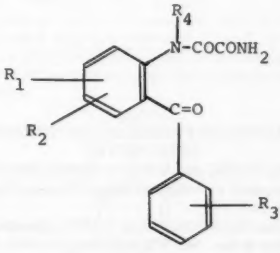
U.S. Cl. 260—251 QB **6 Claims**

1. A process for preparing a quinazolinone of the formula,



(I)

wherein R_1, R_2 and R_3 are independently hydrogen atom, halogen atom, trifluoromethyl, nitro, lower aklylsulfonyl, lower alkyl or lower alkoxy; and R_4 is hydrogen atom, lower alkyl, benzyl, chlorobenzyl, fluorobenzyl, phenethyl, phenylpropyl, (C_1-C_4alkoxy)C_1-C_4 alkyl, polyhalo C_1-C_3alkyl, or (C_3-C_6 cycloalkyl)C_1-C_4 alkyl, which comprises the step of reacting an oxamide of the formula,



(II)

wherein R_1, R_2, R_3 and R_4 are as defined above, with a halogen, sodium hypohalite, potassium hypohalite or calcium

hypohalite in the presence of a base selected from the group consisting of alkali metal hydroxides, alkali metal carbonates and alkali metal alkoxides under cooling or at a temperature up to the reflux temperature of the solvent used.

3,910,912

N-SUBSTITUTED IMINOCOUMARIN DYES

Horst Scheuermann; Dietmar Augart, both of Ludwigshafen, and Wolfgang Mach, Hockenheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

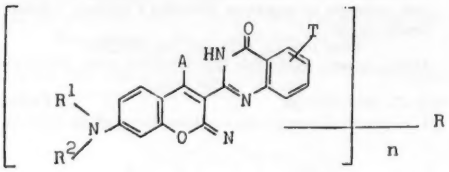
Filed May 23, 1973, Ser. No. 362,900

Claims priority, application Germany, May 30, 1972, 2226211

Int. Cl.[2] B07D *239/74*

U.S. Cl. 260—256.4 Q **3 Claims**

1. A dye of the formula:



in which

A is hydrogen, methyl or ethyl,

R^1 and R^2 are alkyl of one to four carbon atoms,

T is hydrogen or chloro,

n is 1 or 2 and

R is a monovalent moiety selected from the group consisting of hydroxy, alkyl of three to eight carbon atoms, phenylalkyl of seven to nine carbon atoms, hydroxyalkyl of two to six carbon atoms, alkoxyalkyl of a total of three to seven carbon atoms, dialkylaminoalkyl of a total of four to 11 carbon atoms, alkylammoniumalkyl of a total of six to 12 carbon atoms, cyclohexyl, methylcyclohexyl, phenyl and phenyl substituted by methyl, ethyl, methoxy, ethoxy, chloro, cyano, carbamoyl, sulfamoyl carboxyl, amino or dialkylamino of one to four carbon atoms in the alkyl groups, or a divalent moiety selected from the group consisting of

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3,910,913

4,5-DIAMINO-7H-PYRROLO[2,3-D]PYRIMIDINE DERIVATIVES

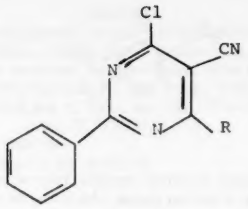
Dong H. Kim, Wayne, and Arthur A. Santilli, Havertown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 148,913, June 1, 1971, abandoned, which is a division of Ser. No. 874,053, Nov. 4, 1969, Pat. No. 3,631,045. This application July 5, 1973, Ser. No. 376,475

Int. Cl.[2] C07D *239/42*

U.S. Cl. 260—256.4 N **4 Claims**

1. A compound selected from those having the formula



wherein R is amino, methylamino and ethylamino.

3,910,914

5-HETEROCYCLIC-1,2,3,6-TETRAHYDRO-4(5H)-PYRIMIDINETHIONES AND PYRIMIDINONE INTERMEDIATES THEREFOR

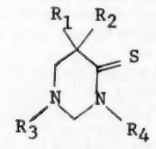
Bernard Loev, Broomall, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Jan. 21, 1974, Ser. No. 435,048

Int. Cl.[2] C07D *239/10*

U.S. Cl. 260—256.5 R **4 Claims**

1. A compound of the formula:



in which:

R_1 is 2-pyridyl, 2-pyrimidinyl, 4-pyrimidinyl, 2-pyrazinyl, 2-pyrrolyl, 2-quinolyl, 2-thiazolyl or 4-thiazolyl;

R_2 is lower alkyl, phenyl or phenyl monosubstituted with halogen, lower alkyl of from one to four carbon atoms or lower alkoxy of from one to four carbon atoms; and

R_3 and R_4 are hydrogen or lower alkyl or a pharmaceutically acceptable acid addition salt thereof.

3,910,915

1-ARYL-2-[(SUBSTITUTED AMINO)ALKANOYL]-1,2,3,4-TETRAHYDROISOQUINOLINES

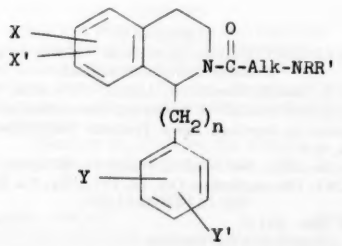
Peter K. Yonan, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed July 23, 1973, Ser. No. 381,854

Int. Cl.[2] C07D *295/10*

U.S. Cl. 260—268 BQ **4 Claims**

1. A compound of the formula



wherein X and X′ are each selected from the group consisting of hydrogen, methoxy, hydroxy, benzyloxy and methyl, or X and X′ together represent a single methylenedioxy or ethylenedioxy group; Y and Y′ are each selected from the group consisting of hydrogen, halogen and methoxy; *n* is selected from the group consisting of 0 and 1; Alk is lower alkylene separating the atoms attached thereto by at least 2 carbon atoms; and NRR′ is selected from the group consisting of di(lower alkyl)amino, N-cyclohexyl-(lower alkylamino), 1-pyrrolidinyl, hexamethyleneimino, morpholino, piperidino, 4-phenylpiperidino, 4-benzylpiperidino, 4-methyl-1-piperazinyl and 4-phenyl-1-piperazinyl.

3,910,916
1-(4-METHANESULFONYL PHENACYL)-4-PHENYL PIPERAZINE

Miroslav Protiva; Zdenek Vejdelek; Jan Metys, all of Prague, and Frantisek Hradil, Pardubice, all of Czechoslovakia, assignors to SPOFA United Pharmaceutical Works, Prague, Czechoslovakia

Filed Dec. 26, 1973, Ser. No. 427,568

Claims priority, application Czechoslovakia, Dec. 22, 1972, 8872-72

Int. Cl.² C07D *295/10*

U.S. Cl. 260—268 PH **1 Claim**

1. 1-(4-Methanesulfonylphenacyl)-4-phenylpiperazine or the corresponding maleate.

3,910,917
1-OXO-HEXAHYDROACRIDINES

Horst Meyer; Friedrich Bossert, both of Wuppertal; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

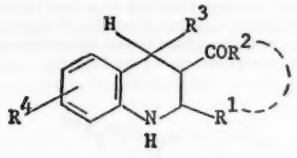
Filed Feb. 25, 1974, Ser. No. 445,167

Claims priority, application Germany, Mar. 3, 1973, 2310746

Int. Cl.² C07D *491/04, 219/06, 25/16;* **A61K** *31/435*

U.S. Cl. 260—279 R **8 Claims**

1. A compound of the formula:



wherein

R^1 and R^2 are linked together to form a ring having 6 carbon atoms, said carbon atoms including the carbon atom of the pyridyl moiety and the carbon atom of the carbonyl group attached to R^2;

R^3 is phenyl unsubstituted or substituted by 1 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, nitro, cyano, trifluoromethyl and alkylmercapto of 1 to 4 carbon atoms in the alkyl moiety or by di-halo or dimethyl; naphthyl; thenyl; or furyl; and

R^4 is hydrogen, halogen, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms.

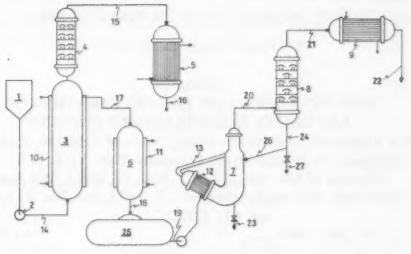
3,910,918
1,2-DIHYDROQUINOLINES AND PROCESS AND APPARATUS FOR THE OBTENTION THEREOF

Heliodoro Monroy, Insurgentes Sur 591-7°piso, Mexico (18 D.F.)

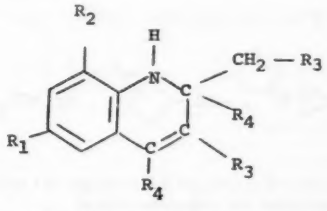
Division of Ser. No. 137,217, April 26, 1971, abandoned. This application Feb. 9, 1973, Ser. No. 331,210

Int. Cl.² C07D *215/18, 215/20*

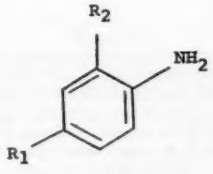
U.S. Cl. 260—283 SY **3 Claims**



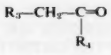
1. In a process for the preparation of 1,2-dihydroquinolines of the formula



wherein R_1 is hydrogen, hydroxy, C_1 to C_4 alkoxy, nitro, or halogen; R_2 is hydrogen, nitro, halogen, C_1 to C_4 alkyl, C_6 or C_{10} carbocyclic aryl or C_2 to C_4 carboxy alkyl; R_3 is hydrogen or C_1 to C_5 alkyl; and R_4 is hydrogen, C_1 to C_4 alkyl or C_7 to C_{12} aralkyl or alkaryl wherein the aryl portions are carbocyclic aryl groups as defined above by condensing an aromatic amine of the formula



wherein R_1 and R_2 are as above, with a substituted carbonyl compound having the formula



wherein R_3 and R_4 are as above, the improvement comprising effectuating the condensation reaction in the presence of condensation catalyst selected from the group consisting of iodine, p-toluene sulfonic acid and sulfanilic acid and an activator selected from the group consisting of ethylene dichloride, dichloroethylene, and trichloroethylene wherein the amount of said condensation catalyst ranges between about 1% and 4% by weight with respect to the aromatic amine and wherein the amount of said activator ranges between about 13% and 80% by weight with respect to said condensation catalyst whereby the relative amount of said substituted carbonyl compound required for the completion of the condensation reaction with said aromatic amine does not exceed a molar ratio of about 3.33 moles of carbonyl compound for each mole of aromatic amine in the reaction system.

3,910,919

NEW SYNTHESIS FOR THE PREPARATION OF 3-HYDROXY-N-ALKYLISOMORPHINANS

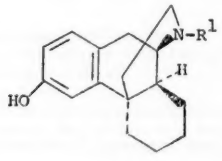
Ivo Monkovic, and Henry Wong, both of Candiac, Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 229,201, Feb. 24, 1972, Pat. No. 3,803,150. This application Nov. 7, 1973, Ser. No. 413,463

Int. Cl.[2] C07D *221/38*

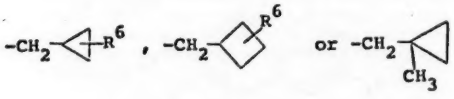
U.S. Cl. 260—285 **4 Claims**

1. The process of preparing compounds having the formula



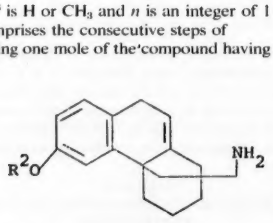
XIIp

wherein R^1 is C_2–C_9 (lower)alkyl, $-(CH_2)_n-C_6H_5$,

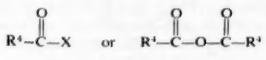


in which R^6 is H or CH_3 and n is an integer of 1 to 3; which process comprises the consecutive steps of

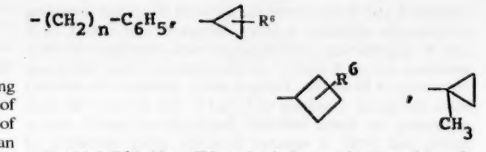
A. acylating one mole of the compound having the formula



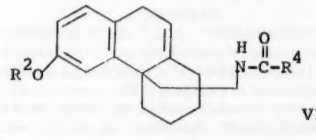
in which R^2 is (lower)alkyl of 1 to 10 carbon atoms, with at least one mole of an acylating agent having the formula



in which X is OH, Cl, Br or I, R^4 is (lower)alkyl of 1 to 9 carbon atoms,



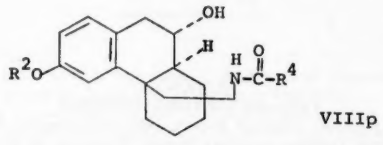
in which R^6 is H or CH_3 and n is 0 or an integer of 1 to 2, in an inert organic solvent selected from the group consisting of methylene chloride, benzene, xylene, ether, dichloroethane and chloroform, in the presence of at least one mole or of a tertiary amine selected from the group consisting of triethylamine, trimethylamine, pyridine, N-methylpiperidine and N-methylpyrrolidine to produce the compound having the formula



VIIp

in which R^4 and R^2 are as above;

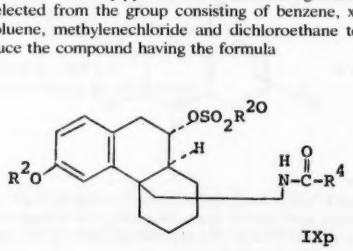
B. treating one mole of compound VIIp with at least one mole of boron trihydride, in an anhydrous organic solvent selected from the group consisting of dry tetrahydrofuran, benzene, dioxane, diethylether, diisopropylether and dibutylether, subsequently with at least one mole each of hydrogen peroxide and water in the presence of an alkali metal hydroxide to produce the compound having the formula



VIIIp

in which R^2 and R^4 are as above;

C. esterifying one mole of compound VIIIp with at least one mole of a (lower)alkyl of 1 to 10 carbon atoms, benzene or toluene sulfonyl halide, in which halide is chloro, bromo or iodo, in the presence of a least one mole of a tertiary amine selected from the group consisting of triethylamine, trimethylamine, pyridine, N-methylpiperidine and N-methylpyrrolidine in an inert organic solvent selected from the group consisting of benzene, xylene, toluene, methylenechloride and dichloroethane to produce the compound having the formula

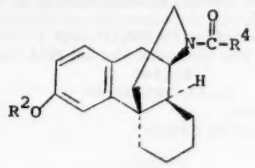


IXp

in which R^2 and R^4 are as above and R^{20} is (lower)alkyl of 1 to 10 carbon atoms, phenyl or tolyl;

D. cyclizing one mole of compound IXp by treatment with at least one mole of sodium hydride, in an inert organic solvent selected from the group consisting of benzene, dimethylformamide, dimethylacetamide, toluene, xylene,

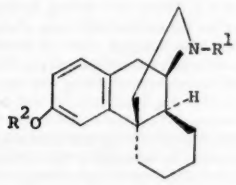
tetrahydrofuran and dioxane, to produce the compound having the formula



Xp

in which R^2 and R^4 are as above;

E. reducing one mole of compound Xp with an excess of lithium aluminum hydride in an inert organic solvent selected from the group consisting of tetrahydrofuran, dioxane, diethylether, dipropylether and dibutylether with the aid of heat to produce the compound having the formula



XIp

in which R^2 and R^1 are as above; and

F. cleaving the ether function of compound XIp by treatment with at least an equimolar quantity of pyridine hydrochloride, boron tribromide or hydrobromic acid.

3,910,920

3,14,17-SUBSTITUTED-6,7-TETRAMETHYLENEMORPHINANS

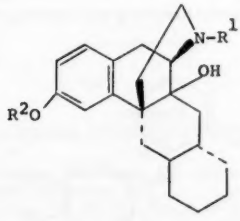
Marcel Menard, Candiac, and Pierre Rivest, Montreal, both of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Filed Nov. 7, 1973, Ser. No. 413,464

Int. Cl.² C07D *221/38, 491/08;* **A61K** *31/485*

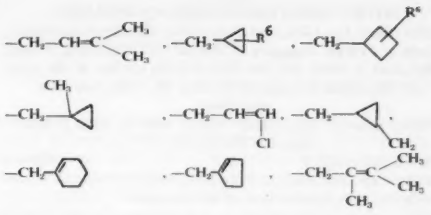
U.S. Cl. 260—285 **21 Claims**

1. A compound having the formula



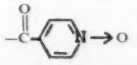
L

wherein R^1 is selected from the group consisting of $—CH_2C$ H, $—CH_2—CH=CH_2$,

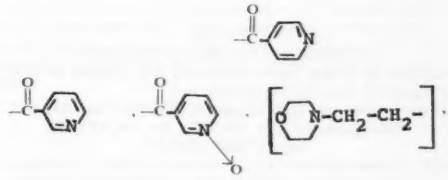


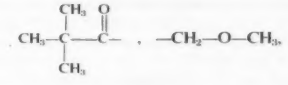
and

in which R^6 is H or CH_3, R^2 is selected from the group consisting of H, (lower)alkyl of 1 to 6 carbon atoms,

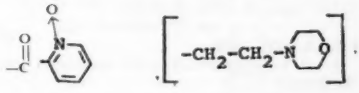


(lower)alkanoyl of 2 to 6 carbon atoms,





and



or a pharmaceutically acceptable acid addition salt thereof.

3,910,921

PAPAVERINE MONOPYRIDOXAL PHOSPHATE

Andre Esanu, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, Issy-les-Moulineaux, France

Continuation-in-part of Ser. No. 91,550, Nov. 20, 1970, abandoned. This application Mar. 6, 1973, Ser. No. 338,604

Claims priority, application France, Jan. 8, 1970, 70.919

Int. Cl.² C07D *215/58*

U.S. Cl. 260—286 R **1 Claim**

1. Papaverine monopyridoxal phosphate.

3,910,922
NOVEL TRIFLUOROMETHYL-QUINOLINES

André Allais, Les Lilas, and Jean Meier, Coeuilly-Champigny, both of France, assignors to Roussel-UCLAF, Paris, France

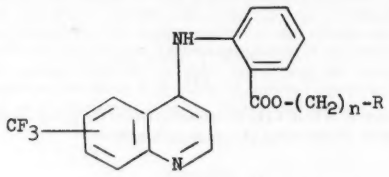
Filed June 3, 1969, Ser. No. 830,148The portion of the term of this patent subsequent to June 10, 1986, has been disclaimed.

Claims priority, application France, Nov. 8, 1968 173.099

Int. Cl.[2] C07D *215/14*

U.S. Cl. 260—287 R 4 Claims

1. A compound selected from the group consisting of 7- and 8-trifluoromethyl-quinolines of the formula



wherein *n* is 1 or 2 and R is selected from the group consisting of β-pyridyl and α-tetrahydrofuryl and their non-toxic, pharmaceutically acceptable acid addition salts.

3,910,923
ISOINDOLO [7,1,2,-HIJ] QUINOLINES)

Seymour D. Levine, North Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 215,189, Jan. 3, 1972, Pat. No. 3,819,624. This application Nov. 19, 1973, Ser. No. 417,156

Int. Cl.[2] C07D *215/16*

U.S. Cl. 260—287 P 7 Claims

1. The compound having the name 1-acrylamido-2,3-dihydroisoindolo[7,1,2-hij]quinolin-5(1H)-one.

3,910,924
3,4-DIHYDROCARBOSTYRIL DERIVATIVES AND A PROCESS FOR PREPARING THE SAME

Yasumitsu Tamura, Takarazuka; Kazuyuki Nakagawa, Tokushima; Shiro Yoshizaki, Komatsujima, and Nanami Murakami, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical, Tokyo, Japan

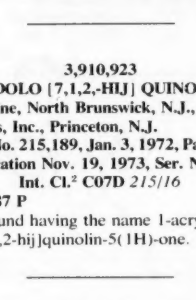
Filed Jan. 19, 1973, Ser. No. 324,905

Claims priority, application Japan, Apr. 13, 1972, 47-37181; Apr. 13, 1972, 47-37182

Int. Cl.[2] C07D *215/22*

U.S. Cl. 260—288 R 6 Claims

1. A 3,4-Dihydrocarbostyril compound represented by the formula



(I)

and the pharmaceutically acceptable acid addition salts thereof, wherein R represents a straight or branched alkyl group having 1 to 4 carbon atoms.

3,910,925
[2-(2-METHYL-5-NITRO-1-IMIDAZOLYL)ETHYL]BENZO(B)PYRIDYLOXY ETHERS

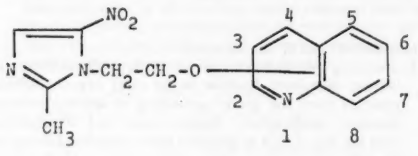
Eunice M. Kreider, Chicago, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 288,111, Sept. 11, 1972, Pat. No. 3,828,056. This application May 24, 1974, Ser. No. 473,145

Int. Cl. C07d *33/50*

U.S. Cl. 260—288 R 7 Claims

1. A compound of the formula



having carbon-oxygen linkage to the benzo(b)pyridyl ring in the 4 or 8-position and positions 2–8 having hydrogen or having substituents on the benzo(b)pyridyl ring wherein the 8-position is substituted with halogen, nitro, or lower alkyl having 1–7 carbon atoms when the carbon-oxygen linkage is to the 4-position of the benzo(b)pyridyl ring and the 5-position of the benzo(b)pyridyl ring is substituted with halogen, nitro, or lower alkyl having 1–7 carbon atoms or the 5 and 7 -positions of the benzo(b)pyridyl ring are substituted with halogen and the 2-position is substituted with lower alkyl having 1–7 carbon atoms when the oxygen linkage is in the 8-position.

3,910,926
ISOINDOLO [7,1,2-HIJ]QUINOLINES

Seymour D. Levine, North Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 215,189, Jan. 3, 1972, Pat. No. 3,819,624. This application Nov. 19, 1973, Ser. No. 417,157

Int. Cl.[2] C07D *215/20*

U.S. Cl. 260—289 C 8 Claims

1. The compound having the name 2,3-dihydroisoindolo[7,1,2-hij]quinoline-1,5-dione.

3,910,927
3-HYDROXYISOQUINOLINE ETHERS

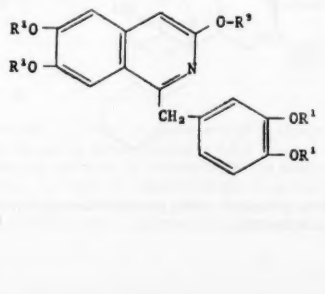
William Eugene Kreighbaum, and William Timmey Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 184,197, Sept. 27, 1971, Pat. No. 3,798,225. This application Dec. 11, 1973, Ser. No. 423,841

Int. Cl.[2] C07D *217/20*

U.S. Cl. 260—289 R 6 Claims

1. A compound selected from the group consisting of those having the formula



wherein

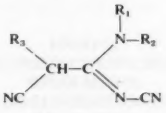
R^1 is lower alkyl having up to 4 carbon atoms;
R^3 is lower alkyl having up to 4 carbon atoms, alkenyl having from 3 to 6 carbon atoms, cycloalkyl having from 3 to 5 carbon atoms, benzyl;
and pharmaceutically acceptable acid addition salts thereof.

3,910,928
3-(CYANIMINO)-PROPIONITRILES

John M. McCall, and Joseph J. Ursprung, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 26, 1974, Ser. No. 464,476
Int. Cl.² C07D *295/14*
U.S. Cl. 260—293.51 **11 Claims**

1. A compound of the formula



wherein

R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, alkyl of one to ten carbon atoms, inclusive, alkenyl of two to ten carbon atoms, inclusive, cycloalkyl of five to eight carbon atoms, inclusive, unsubstituted or substituted with one to three alkyl groups, said alkyl group having from one to three carbon atoms, inclusive, and further said alkyl groups being the same or different if two or three alkyl groups present, and phenylalkyl with alkyl of one to six carbon atoms, inclusive, and R_1 and R_2, when taken together with the nitrogen atom to which they are attached, form a heterocyclic ring of three to seven carbon atoms, inclusive, morpholino, piperazino, N-alkylpiperazino, where alkyl is from one to three carbon atoms, inclusive, each of the rings having attached as substituents on carbon atoms thereof zero to three alkyl groups, inclusive, said alkyl being the same or different if two or more alkyl group substituents, and having from one to three carbon atoms, inclusive, and

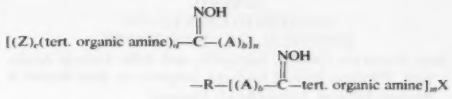
R_3 is selected from the group consisting of hydrogen, alkyl of one to six carbon atoms, inclusive, alkenyl of two to six carbon atoms, inclusive, cycloalkyl of five to eight carbon atoms, inclusive, unsubstituted or substituted with one to three alkyl groups, said alkyl group having from one to three carbon atoms, inclusive, and being the same or different if two or more alkyl groups are present, and phenylalkyl wherein alkyl is from one to six carbon atoms, inclusive.

3,910,929
POLYFUNCTIONAL QUATERNARY AMIDOXIMIDINIUM SALTS

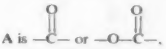
David S. Breslow, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 250,504, May 5, 1972. This application Jan. 29, 1974, Ser. No. 437,548
Int. Cl.² C07D *453/02*
U.S. Cl. 260—293.53 **3 Claims**

1. A polyfunctional compound having the formula



wherein R is an organic radical selected from the group consisting of hydrocarbon, halide substituted hydrocarbon, hydrocarbon-oxy-hydrocarbon, hydrocarbon-thio-hydrocarbon, and hydrocarbon-sulfonyl-hydrocarbon radicals, said hydrocarbon radical being selected from the group consisting of alkylene radicals containing 2–18 carbon atoms, arylene radicals containing 1–2 rings, cycloalkylene radicals containing 4–8 carbon atoms, arylene-dialkylene radicals containing 8–10 carbon atoms, alkylene-diarylene radicals containing 13–14 carbon atoms, and cycloalkylene-dialkylene radicals containing 7–8 carbon atoms,



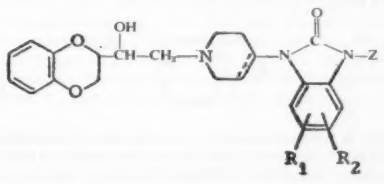
b is zero or 1, tert. organic amine is selected from the group consisting of quinuclidine, 3-hydroxyquinuclidine and N-substituted pyrrolidines, piperidines and morpholines having a dissociation constant greater than 1×10^{-12} as determined at 25°C., Z is chloride, bromide or iodide, *n* and *m* are 1 to 3, *c* and *d* are zero or 1, with *c* being 1 when *d* is zero, and with *d* being 1 when *c* is zero, and X is the anion of an acid having a dissociation constant greater than 1.0×10^{-3} as determined at 25°C., the number of X's being equal to the number of tert. organic amines when X is monovalent and being equal to one-half the number of tert. organic amines when X is divalent.

3,910,930
1- 1-[2-(1,4-BENZODIOXAN-2-YL)-2-HYDROXYETHYL]-4-PIPERIDYL -2-BENZIMIDAZOLINONES

Paul Adriaan Jan Janssen, Vosselaar; Ineke van Wijngaarden, Beerse, and Willem Soudijn, Turnhout, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 321,058, Jan. 4, 1973, abandoned. This application Nov. 20, 1973, Ser. No. 417,702
Int. Cl.² C07D *405/14*
U.S. Cl. 260—293.58 **24 Claims**

1. A compound selected from the group consisting of a benzimidazolinone derivative having the formula



and the therapeutically active acid addition salts and stereochemical optical isomeric forms thereof, wherein:

Z is a member selected from the group consisting of hydrogen, loweralkyl, loweralkenyl, loweralkyloxy-loweralkyl, phenoxyloweralkyl, loweralkyl-carbonyl-loweralkyl, cyano-loweralkyl, phenyl-loweralkyl, hydroxy-loweralkyl, di-loweralkyl-aminoloweralkyl, 1-pyrrolidinyl-loweralkyl, 1-piperidyllowerallkyl, and loweralkyloxy-carbonyl-loweralkyl;

R_1 and R_2 are each a member selected from the group consisting of hydrogen, halo and loweralkyl; and

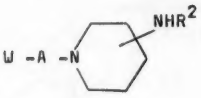
the dotted line indicates an optional double bond.

3,910,931
1-(NAPHTHYLALKYL- OR INDENYLALKYL)-PIPERIDINES

John Frederick Cavalla, Isleworth, and John Leheup Archibald, Windsor, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 323,684, Jan. 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 175,345, Aug. 26, 1971, abandoned. This application Nov. 15, 1974, Ser. No. 524,162
Int. Cl.[2] C07D *211/58*
U.S. Cl. 260—293.62 12 Claims

1. A heterocyclic compound of the formula:



(I)

wherein W represents a carbocylic aryl radical selected from naphthyl, 1,2,3,4-tetrahydro-naphthyl and indenyl radicals, A represents a lower alkylene radical, a mono -keto lower alkylene radical, a hydroxy-lower-alkylene radical or a bivalent radical of the formula —O—$CH_2CH(OH)$ CH_2— or —O—(-lower alkylene)—, R^2 represents hydrogen or the group —COR, where R represents a phenyl radical or a cyclohexyl radical, the term "lower" means that the radical contains from 1 to 6 carbon atoms, or a pharmaceutically acceptable acid addition salt thereof.

3,910,932
PYRIDYLALKYL-PIPERIDINES

John Frederick Cavalla, Isleworth, and John Leheup Archibald, Windsor, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 323,684, Jan. 15, 1973, which is a continuation-in-part of Ser. No. 175,345, Aug. 26, 1971, abandoned. This application Nov. 15, 1974, Ser. No. 524,030
Int. Cl.[2] C07D *211/58*
U.S. Cl. 260—293.69 3 Claims

1. A pyridine compound of the formula

(I)

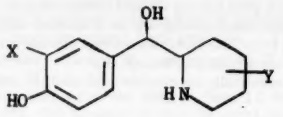
wherein W represents pyridyl, A represents a lower alkylene radical of 1 to 4 carbon atoms, R represents a radical selected from phenyl and phenyl substituted by halogen, lower alkoxy or lower alkyl, or a pharmaceutically acceptable acid addition salt thereof.

3,910,933
3-SUBSTITUTED-4-HYDROXYPHENYL-2-PIPERIDYL-CARBINOLS

Carl Kaiser, Haddon Heights, and Joe R. Wardell, Jr., Willingboro, both of N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Oct. 19, 1973, Ser. No. 408,147
Int. Cl.[2] C07D *211/26*
U.S. Cl. 260—293.73 10 Claims

1. A compound of the formula



where
X is R_2NCONH, $RCONH$, R_2N, $R'OCONH$, or $R'SO_2CH_2$; each R is hydrogen or C_1–C_3 alkyl;
R' is C_1–C_3 alkyl; and
Y is hydrogen or C_1–C_6 alkyl,
or a non-toxic pharmaceutically acceptable salt thereof.

3,910,934
PROCESS FOR THE PREPARATION OF α-(HYDROXY AND ALKOXY SUBSTITUTED)PHENYL-α-(2-PIPERIDINYL)-METHANOLS

George H. Sankey, Loughborough, and Keith D. E. Whiting, Hatfield, both of England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 39,571, May 21, 1970, abandoned. This application Aug. 7, 1974, Ser. No. 495,335
Int. Cl.[2] C07D *211/22*
U.S. Cl. 260—293.84 1 Claim

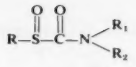
1. A process for preparation of α-(polyhydroxyphenyl)-α-(phenethyl-2-piperidinyl)methanol and α-(polyhydroxyphenyl)-α-(dibenzylmethyl-2-piperidinyl)methanol which comprises condensing a (poly-lower alkoxyphenyl) (methyl-2-pyridyl)ketone and 1,3-propanediol in an inert organic solvent at reflux temperature of the solvent and in the presence of p-toluenesulfonic acid catalyst to form a 2-(poly-lower alkoxyphenyl)-2-(methyl-2-pyridyl)-1,3-dioxane, C-benzylating said 2-(poly-lower alkoxyphenyl)-2-(methyl-2-pyridyl)-1,3-dioxane by treatment with phenyllithium followed by benzyl chloride to form 2-(poly-lower alkoxyphenyl)-2-(phenethyl-2-pyridyl)-1,3-dioxane and 2-(poly-lower alkoxyphenyl)-2-(dibenzylmethyl-2-pyridyl)-1,3-dioxane, demethylating and hydrolytically cleaving the dioxane ring of said compounds to form (poly-hydroxyphenyl) (phenethyl-2-pyridyl)ketone and (poly-hydroxyphenyl) (dibenzylmethyl-2-pyridyl)ketone which are hydrogenated in the presence of platinum catalyst to yield the α-(polyhydroxyphenyl)-α-(phenethyl-2-piperidinyl)methanol and α-(polyhydroxyphenyl)-α-(dibenzylmethyl-2-piperidinyl)methanol.

3,910,935
CARBAMOYL SULFOXIDE DERIVATIVES

Francis Harry Walker, Mill Valley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

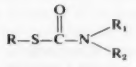
Continuation of Ser. No. 280,383, Aug. 14, 1972, abandoned. This application Aug. 24, 1973, Ser. No. 391,386
Int. Cl.[2] C07D *213/52*
U.S. Cl. 260—294.8 E 2 Claims

1. A process of manufacturing a pesticidal active compound having the following formula:



wherein R is pyridylmethyl, R_1 and R_2 can be the same or different and are selected from the group consisting of lower alkyl cyclohexyl, allyl and benzyl, comprising the steps of

a. combining an oxidizing agent selected from the group consisting of peracetic acid and m-chloroperoxybenzoic acid and a thiocarbamate compound in a solvent system; said thiocarbamate having the following formula:



wherein R, R_1 and R_2 have been defined above;

b. maintaining the temperature between −25°C. and 15°C.

c. said oxidizing agent being present in an amount of at least one molar equivalent.

3,910,936

DIARYL-PYRIDYL-IMIDAZOLE METHANES AND THEIR PRODUCTION

Wilfried Draber; Manfred Plempel, and Karl Heinz Buchel, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

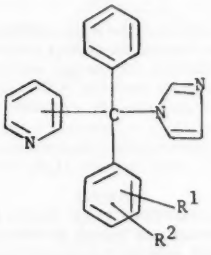
Filed June 7, 1973, Ser. No. 367,849

Claims priority, application Germany, June 15, 1972, 2229128

Int. Cl.² C07D *213/32*

U.S. Cl. 260—294.8 R **21 Claims**

1. A compound of the formula



or a pharmaceutically acceptable, non-toxic salt thereof wherein

R^1 and R^2 are the same or different alkyl of 1 to 4 carbon atoms.

3,910,937

CERTAIN BIS-(HYDROXYALKYL)ESTERS OF 1,4-DIHYDRO-2,6-DILOWERALKYL-4-(2-TRIFLUOROMETHYLPHENYL)PYRIDINE-3, 5 DICARBOXYLIC ACID AND THE N-METHYL DERIVATIVE THEREOF

Anthony Maitland Roe, Hatfield; Robert Antony Slater, Letchworth, both of England, and Bernard Loev, Broomall, Pa., assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

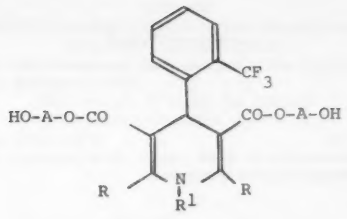
Filed June 5, 1974, Ser. No. 476,346

Claims priority, application United Kingdom, June 12, 1973, 27793/73

Int. Cl.² C07D *211/90*

U.S. Cl. 260—295.5 R **4 Claims**

1. A 1,4-dihydropyridine compound of the formula:



wherein R is lower alkyl, R^1 is hydrogen or methyl and A is a straight or branched alkylene chain the backbone of which contains from 2 to 4 carbon atoms.

3,910,938

BERBINE DERIVATIVES

Tetsuro Ikekawa, Narashino; Fumitake Shimada, Iwatsuki; Yoshimi Okazaki, Tokyo; Koichi Tachibana, Ohmiya, and Norio Aikawa, Settsu, all of Japan, assignors to Kanebo, Ltd., Tokyo and Tetsuro Ikekawa, Chiba, both of, Japan

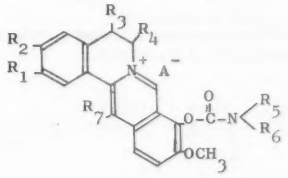
Filed Jan. 16, 1974, Ser. No. 433,712

Claims priority, application Japan, Jan. 27, 1973, 48-11145; May 9, 1973, 48-51968; May 11, 1973, 48-52855

Int. Cl.² C07D *471/00*

U.S. Cl. 260—295 A **25 Claims**

1. A berbine derivative of the formula:



III

wherein R_1 and R_2 represent each a methoxy group or jointly a methylenedioxy group; R_3 and R_4 represent each a hydrogen atom or jointly a direct bond; R_5 and R_6 represent, the same or different, a hydrogen atom, a lower alkyl or phenyl group; R_7 represent a hydrogen atom or a lower alkyl group; and A represent a pharmaceutically acceptable anion.

3,910,939

PROCESS FOR PREPARING 1,2,5-THIADIAZOL-3-YLACETIC ACID FROM 3-METHYL-1,2,5-THIADIAZOLE

Kazuo Kariyone, Kyoto; Kunihiko Tanaka, Toyonaka, and Keiji Takai, Nara, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

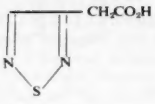
Filed June 25, 1973, Ser. No. 372,796

Claims priority, application Japan, June 27, 1972, 47-64625

Int. Cl.² C07D *285/10*

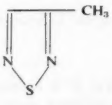
U.S. Cl. 260—302 D **5 Claims**

1. A process for preparing the compound of the formula

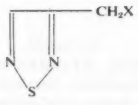


which comprises the steps:

a. halogenating the compound

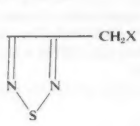


with a halogenating agent selected from the group consisting of N-bromo-succinimide and 1,3,5-trichloro-s-triazine-2,4,6-(1H, 3H, 5H)-trione in the presence of α, α'-azobisisobutyronitrile to form the compound of the formula

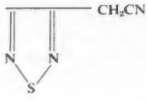


wherein X is bromine or chlorine,

b. treating the compound

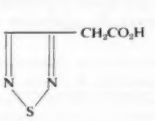


wherein X is as defined above, with hydrogen cyanide or a salt thereof to form the nitrile of the formula



and

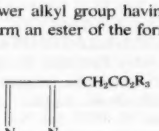
c-1. hydrolyzing said nitrile by treatment with an acid selected from the group consisting of hydrochloric and sulfuric to the compound



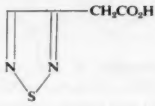
or

c-2. treating said nitrile with a lower alkanol of the formula R_3—OH

wherein R_3 is a lower alkyl group having from one to four carbon atoms to form an ester of the formula



and then hydrolyzing said ester to the acid



3,910,940

ANTHELMINTIC 5-(HETEROCYCLYL)-3-(ISOTHIOCYANOPHENYL)OXADIAZOLES

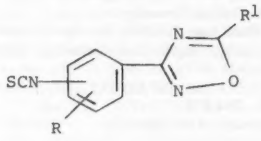
Venkatachala L. Narayanan, Hightstown, and Rudiger D. Haugwitz, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 347,312, April 2, 1973, Pat. No. 3,853,893. This application Sept. 26, 1974, Ser. No. 509,512

Int. Cl.[2] C07D *271/06*

U.S. Cl. 260—302 H **8 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of hydrogen, chlorine, bromine, fluorine, lower alkyl, lower alkoxy, phenyl, trifluoromethyl, di(lower alkyl)amino, and acetamido; R^1 is selected from the group consisting of thienyl, thiazolyl, furyl and pyrryl; and pharmaceutically acceptable salts thereof.

3,910,941

IMIDAZO HETEROCYCLIC DERIVATIVES

Ralph William Turner, and Timothy Paul Seden, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

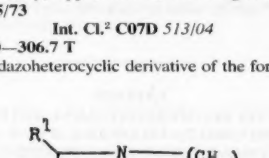
Filed Mar. 8, 1974, Ser. No. 449,556

Claims priority, application United Kingdom, Mar. 22, 1973, 13795/73

Int. Cl.[2] C07D *513/04*

U.S. Cl. 260—306.7 T **4 Claims**

1. An imidazoheterocyclic derivative of the formula:



I

wherein R^1 is hydrogen, an unsubstituted phenyl, naphthyl, furyl, thienyl or pyridyl or a phenyl substituted by one or two substituents selected from the group consisting of halogen, alkyl, haloalkyl, alkoxy and alkylthio of 1 to 4 carbon atoms, dialkylamino and alkanoylamine of up to 6 carbon atoms and nitro; R^2 is a radical of the formula R^4CO or a radical of the formula:

II

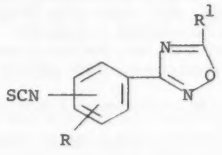
wherein R^4 is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl or alkynyl of up to 6 carbon atoms, phenylalkyl of up to 8 carbon atoms, thienyl, phenyl or phenyl substituted by a halogen; R^5 is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl or alkynyl of up to 6 carbon atoms or phenylalkyl of up to 8 carbon atoms; R^6 is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of up to 6 carbon atoms, phenylalkyl or alkanoyl of up to 8 carbon atoms or benzoyl; R^3 is hydrogen or alkyl of 1-2 carbon atoms; and n is 1 or 2; and the non-toxic pharmaceutically-acceptable acid-addition salts thereof.

3,910,942
ANTHELMINTIC (ISOTHIOCYANOPHENYL) OXADIAZOLES

Venkatachala L. Narayanan, Hightstown; Anthony Joseph Martinez, Princeton, and Rudiger D. Haugwitz, Titusville, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 347,313, April 2, 1973, abandoned. This application July 11, 1974, Ser. No. 487,497
Int. Cl.² C07D *271/06*
U.S. Cl. 260—307 G **13 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of hydrogen, lower alkyl, phenyl, halogen, trifluoromethyl, lower alkoxy, phenoxy, di(lower alkyl)amino and lower alkyl

and R^1 is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl of 3 to 6 carbons, adamantyl, halo-lower alkyl, phenyl and substituted phenyl wherein said substituent is chloro, bromo, fluoro, lower alkyl, lower alkoxy, 3,4,5-trimethoxy, or trifluoromethyl.

3,910,943
2-[3,5-DISUBSTITUTED-4H-1,2,4-TRIAZOL-4-YL]BENZHYDROL

Martin Gall, Kalamazoo, and Jackson B. Hester, Jr., Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 172,919, Aug. 18, 1971, Pat. No. 3,813,412. This application Oct. 29, 1973, Ser. No. 410,781The portion of the term of this patent subsequent to May 28, 1991, has been disclaimed.
Int. Cl.² C07D *249/08, 401/06, 403/06, 413/06*
U.S. Cl. 260—308 R **4 Claims**

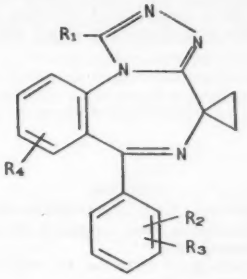
1. 5-Chloro-2-[5-methyl-3-[(dimethylamino)methyl-4H-1,2,4-triazol-4yl]benzhydrol.

3,910,944
SPIRO(CYCLOPROPANE-1,4′-(4H)-S-TRIAZOLO-(4,3-A)(1,4)BENZODIAZEPINES)

Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 20, 1974, Ser. No. 525,363
Int. Cl.² C07D *487/04, 487/10*
U.S. Cl. 260—308 R **11 Claims**

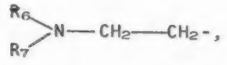
1. A compound of the formula IV:



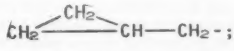
IV

wherein R_1 is hydrogen, methyl, ethyl,

or



in which R_5 is hydrogen or methyl, R_6 and R_7 are hydrogen, methyl or



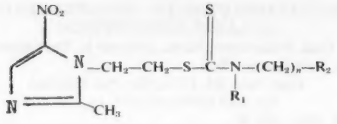
wherein R_2 is hydrogen, chloro, or fluoro; wherein R_3 is hydrogen, or fluoro with the proviso that R_2 is not chloro; and wherein R_4 is hydrogen, chloro, fluoro, bromo, nitro, or trifluoromethyl and the pharmacologicaly acceptable acid addition salts thereof.

3,910,945
2-(2-METHYL-5-NITRO-1-IMIDAZOLYL)ETHYL-N-ARYLALKYLDITHIOCARBAMATES

Eunice M. Kreider, Chicago, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 294,916, Oct. 4, 1972, abandoned. This application Oct. 29, 1973, Ser. No. 410,765
Int. Cl.² C07D *233/94*
U.S. Cl. 260—309 **11 Claims**

1. A compound of the formula



wherein n is a positive integer from 1 to 7, R_1 is hydrogen or lower alkyl, and R_2 is phenyl, furyl or halophenyl containing 1 or 2 halo, (lower alkoxy)phenyl containing 1 or 2 lower alkoxy, or (lower alkyl)phenyl containing 1 lower alkyl.

3,910,946

4H-IMIDAZO[1,2-A][1,4]BENZODIAZEPINES

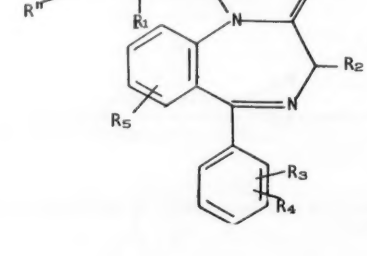
Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 12, 1974, Ser. No. 505,342

Int. Cl.[2] C07D *487/04*

U.S. Cl. 260—309 **11 Claims**

1. A compound of the formula:



wherein R_n, R_1, and R_2 are hydrogen, methyl or ethyl; wherein R_3 is hydrogen, chloro, or fluoro; wherein R_4 is hydrogen or fluoro; wherein R_5 is hydrogen, chloro, fluoro, bromo, trifluoromethyl and nitro; and wherein R′ and R″ are hydrogen or alkyl of from 1 to 3 carbon atoms, and the pharmacologically acceptable acid salts thereof.

3,910,947

PREPARATION OF IMIDAZO[2,1-A]ISOINDOLES

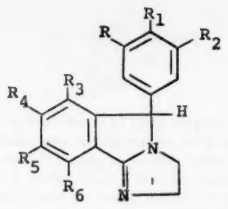
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 844,636, July 24, 1969, abandoned, which is a division of Ser. No. 726,533, May 3, 1968, abandoned, which is a continuation-in-part of Ser. No. 660,609, Aug. 15, 1967, abandoned. This application Oct. 18, 1973, Ser. No. 407,434

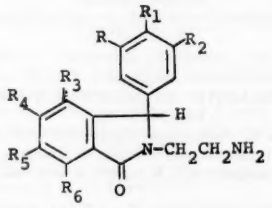
Int. Cl.[2] C07D *49/34*

U.S. Cl. 260—309.6 **4 Claims**

1. A process for preparing a compound of the formula



which comprises reducing a compound of the formula



in an inert ether solvent and under an inert atmosphere with lithium aluminum hydride at a temperature of from about 45° to 85°C. for a period of time sufficient to form the desired product, wherein

each of R, R_1 and R_2 is, independently, hydrogen, chloro, fluoro, straight chain lower alkyl, straight chain lower alkoxy or trifluoromethyl; provided that

1. R, R_1 and R_2 are such that there is never a trifluoromethyl radical on each of two adjacent carbon atoms, and
2. when R or R_2 is trifluoromethyl, R_1 is hydrogen, chloro or fluoro;

each of R_3, R_4 and R_5 is independently, hydrogen, chloro of fluoro, and

R_6 is hydrogen or fluoro,

provided further that not more than two of R_3, R_4, R_5 and R_6 are other than hydrogen and that not more than three of R, R_1, R_2, R_3, R_4, R_5 and R_6 are other than hydrogen.

3,910,948

1,3-DIACYL DERIVATIVES OF IMIDAZOLIDINE

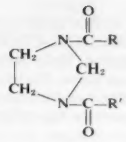
Robert R. Mod; Frank C. Magne; Gene Sumrell, all of New Orleans; Arthur F. Novak, Baton Rouge, all of La., and James M. Solar, Lubbock, Tex., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 154,698, June 18, 1971, abandoned. This application Mar. 4, 1974, Ser. No. 448,429

Int. Cl.[2] C07D *49/34*

U.S. Cl. 260—309.7 **2 Claims**

1. A process for preparing a compound represented by the formula



where R and R′ are saturated or unsaturated alkyl groups, which process comprises reacting N,N′-ethylenebisamide with formaldehyde in the presence of a strong acid catalyst.

3,910,949

MANUFACTURE OF 1,2-DIMETHYL-3,5-DIPHENYLPYRAZOLIUM METHYLSULFATE IN A SINGLE REACTION ZONE

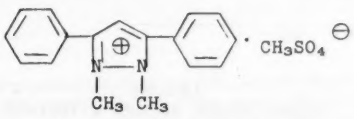
Walter Joseph Stepek; Murray Garber, and Don Wesley Long, all of Trenton, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 9, 1974, Ser. No. 530,789

Int. Cl.² C07D *231/12*

U.S. Cl. 260—311 **2 Claims**

1. A process for the preparation of 1,2-dimethyl-3,5-diphenylpyrazolium methylsulfate having the formula:



comprising the steps of adding in a single reaction zone anhydrous alkali metal hydroxide to an anhydrous solution of 3,5-diphenylpyrazole containing a residual dehydrogenation catalyst, heating said solution in the range of about between 40°C. to 100°C. for a period of about one-half hour to form the alkali metal salt of said pyrazole; reacting said salt of said pyrazole with from about 1 to about 2 mole equivalents of dimethylsulfate for from 1 to 2 hours in the temperature range between 50°C. and 150°C.; filtering off the catalyst; separating the aqueous phase from organic phase; concentrating the said organic phase and rendering the latter phase anhydrous by distilling off part of the solvent and azeotropically removing any water present; adding to the anhydrous organic phase a chlorinated hydrocarbon solvent selected from the group consisting of chloroform and ethylene dichloride; adding at least an equimolar amount of dimethylsulfate; heating the latter reaction mixture at a temperature ranging from about 60°C. to 120°C.; cooling the solution to about 0°C. to 20°C. and recovering 1,2-dimethyl-3,5-diphenylpyrazolium methylsulfate in good yield and purity.

3,910,950

HEXAHYDRO-1H-FURO(3,4-C)PYRROLE COMPOUNDS

Alfred D. Miller, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

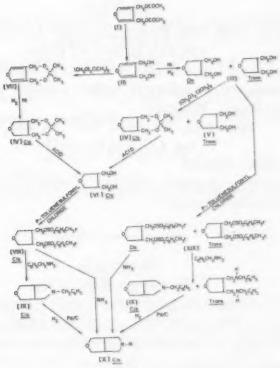
Filed June 14, 1973, Ser. No. 370,010

Int. Cl.² C07D *207/24, 207/12*

U.S. Cl. 260—326.5 B **19 Claims**

1. A compound represented by the formula

wherein R is a radical selected from the group consisting of hydrogen; alkylene (C_1 to C_8) dicarbonyl hexahydro-1H-furo (3,4-c)pyrrole; phenylene dicarbonyl hexahydro-1H-furo (3,4-c)pyrrole; phenyl; phenylacetyl; monoalkoxy (C_1 to C_4) substituted benzoyl; phenylalkyl where the alkyl constituent thereof contains from 1 to 4 carbon atoms; alkenyl (C_3 and C_4); mono-, di-, or tri-halogen substituted phenylalkyl where the alkyl group contains from 1 to 4 carbon atoms and the halogen is substituted on the phenyl ring; benzoyl; mono-, di-, or tri-halogen substituted benzoyl; mono-, di-, or tri-alkyl (C_1



to C_4) substituted benzoyl; mono-, di-, or tri-halogen substituted phenylalkanoyl wherein the alkanoyl group contains from 2 to 4 carbon atoms and the halogen is on the phenyl ring; hexahydrobenzoyl; phenylalkenoyl wherein the alkenoyl group is a lower alkenoyl containing from 3 to 5 carbon atoms; phenylethanoyl; halogen-substituted phenoxyalkanoyl wherein the alkanoyl group contains from 1 to 4 carbon atoms and the phenoxy ring is substituted with from 1 to 3 halogen atoms, alkanoyl (C_3 to C_{18}); haloalkyl (C_1 to C_4) mono-, di-, or tri-substituted benzoyl wherein the haloalkyl group contains from 1 to 5 halogen atoms; mono- or di-hydroxyl substituted alkyl where the alkyl group contains from 1 to 4 carbon atoms; phenylsulfonyl; mono- or di-hydroxyl substituted benzoyl; nicotinoyl; mono- or di-alkanoyloxy (C_1 to C_4) substituted benzoyl; thenoyl; cycloalkyl (C_4 to C_8); and the pharmacologically acceptable acid addition salts thereof.

3,910,951

MANUFACTURE OF SUCCINIMIDE

Ernst Fuerst, Neustadt; Siegfried Winderl, Heidelberg-Wieblingen; Arnold Wittwer, Ludwigshafen, and Herwig Hoffmann, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 11, 1974, Ser. No. 450,146

Claims priority, application Germany, Mar. 17, 1973, 2313386

Int. Cl.² C07D *207/32*

U.S. Cl. 260—326.5 FM **3 Claims**

1. In a process for the manufacture of succinimide by reacting succinic acid with aqueous ammonia solution at a temperature of about 250° to 260°C, the improvement which comprises carrying out the reaction in the presence of an effective minor quantity of tertiary ammonium phosphate.

3,910,952

NOVEL SUBSTITUTED INDOLE COMPOUND, PROCESS FOR THE PREPARATION AND THERAPEUTIC COMPOSITIONS CONTAINING IT

Karl-Heinz Boltze, Bensberg-Kippekausen; Otfried Brendler, Cologne; Hans-Dieter Dell, Bergisch-Gladbach, and Haireddin Jacobi, Leichlingen, all of Germany, assignors to Tropenwerke Dinklage & Co., Cologne (Mulheim), Germany

Filed June 28, 1973, Ser. No. 374,615

Claims priority, application Germany, July 14, 1972, 2234651

Int. Cl.[2] C07D *209/04*

U.S. Cl. 260—326.13 R 1 Claim

1. [1-(p-Chlorobenzoyl)-5-methoxy-2-methyl-3-indole]-acetoxyacetic acid and its salts with pharmacologically acceptable bases.

3,910,953

PROCESS FOR THE PREPARATION OF TRYPTAMINE OR ITS DERIVATIVES

Csaba Szantay; Lajos Szabo, and Gyorgy Kalaus, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT., Budapest, Hungary

Filed Aug. 16, 1973, Ser. No. 388,980

Int. Cl.[2] C07D *209/14*

U.S. Cl. 260—326.15 15 Claims

1. A cis-trans isomeric mixture of ethyl-2-oxo-5-chlorovalerate-phenylhydrazone.

3,910,954

INDENOPYRAN- AND INDENOTHIOPYRANALKYLAMINES

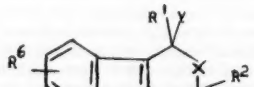
Ivo Jirkovsky; Leslie G. Humber; Christopher A. Demerson, and Thomas A. Dobson, all of Montreal, Canada, assignors to Ayerst, McKenna and Harrison Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 297,129, Oct. 12, 1972, Pat. No. 3,778,449. This application July 9, 1973, Ser. No. 377,696The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.

Int. Cl.[2] C07D *335/04*

U.S. Cl. 260—327 TH 48 Claims

1. A compound selectd from those of formula



Ia.

in which R^1 is lower alkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy or halo; R^7 is hydrogen or lower alkyl; X is oxy or thio; and Y is an amino(lower)alkyl radical of formula -Alk-NR^8R^9 wherein Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 and R^9 together with the nitrogen atom to which they are joined form a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, piperazino, 4-(lower alkyl)-1-piperazinyl and 4-[hydroxy(lower)alkyl]-piperazinyl, and the acid addition salts thereof with pharmaceutically acceptable acids.

3,910,955

BENZOTHIOPHENE-ETHYLAMINES

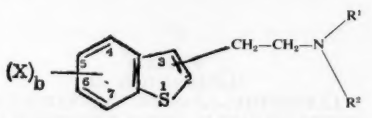
Norman Bellamy Chapman, Hull; Kenneth Clarke, Cottingham, near Hull; Brian Iddon, Tarleton, near Preston; John William James, Langley, and Maurice John Hedge, Windsor, all of England, assignors to Aspro-Nicholas Limited, Slough Bucks, England

Continuation-in-part of Ser. No. 100,485, Dec. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 619,921, March 2, 1967, abandoned. This application June 18, 1973, Ser. No. 370,993

Int. Cl.[2] C07D *333/58*

U.S. Cl. 260—330.5 12 Claims

1. A compound of the formula



wherein $(X)_b$ represents one or more of the same or different substituents in the benzothienyl nucleus; *b* is an integer from 1 to 4; X is halogen and alkyl containing from one to six carbon atoms; and R^1 and R^2 are selected from the group consisting of the same or different hydrogen; and acid addition salt thereof.

3,910,956

MARK-FORMING RECORD MATERIALS

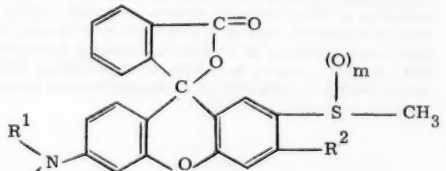
Troy Eugene Hoover, Kettering, Ohio, assignor to NCR Corporation, Dayton, Ohio

Division of Ser. No. 90,098, Nov. 16, 1970, Pat. No. 3,787,325. This application June 29, 1972, Ser. No. 267,283

Int. Cl.[2] C07D *311/86*

U.S. Cl. 260—335 2 Claims

1. A colorless, but colorable chromogenic compound represented by the formula:



wherein each R^1 is hydrogen, methyl or ethyl; each R^2 is hydrogen, methyl, or ethyl and *m* is zero or the integer one.

3,910,957
XANTHONE CARBOXYLIC ACIDS AND DERIVATIVES

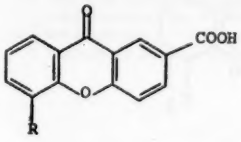
Jurg R. Pfister, Los Altos; Ian T. Harrison, and John H. Fried, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 259,853, June 5, 1972, Pat. No. 3,818,042, which is a continuation-in-part of Ser. No. 217,383, Jan. 12, 1972, Pat. No. 3,873,714, which is a continuation-in-part of Ser. No. 162,696, July 14, 1971, abandoned. This application Feb. 7, 1974, Ser. No. 440,326

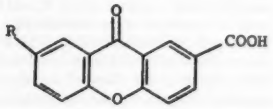
Int. Cl.[2] C07D *311/86*

U.S. Cl. 260—335 **18 Claims**

1. A compound selected from those represented by the following formulas:



(A)



(B)

and the pharmaceutically acceptable, non-toxic alkyl or glycerol esters, unsubstituted, monoalkyl, dialkyl, dialkylaminoalkyl, alkoxyalkyl, or phenethyl substituted amides and salts thereof; wherein each R is a group selected from those of the formula:

in which R′ is hydrogen, lower alkyl, cycloalkyl, tetrahydrofuran-2-yl, tetrahydropyran-2-yl, tetrahydropyran-4-yl, 4-alkoxytetrahydropyran-4-yl, or carboxylic acyl containing up to 12 carbon atoms, and R^1 is hydrogen, lower alkyl or cycloalkyl, and R^2 is hydrogen; lower alkyl; cycloalkyl; phenyl; substituted phenyl in which the substituent is halo, lower alkyl, lower alkoxy, lower alkylthio, trifluoromethyl, or cyano.

3,910,958
PROCESS FOR PREPARING ARYLACETIC ACIDS AND ESTERS THEREOF

Genichi Tsuchihashi, Tama, and Katsuyuki Ogura, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed Oct. 3, 1972, Ser. No. 294,600

Claims priority, application Japan, Oct. 4, 1971, 46-77123; Oct. 6, 1971, 46-77839

Int. Cl. C07d *317/48;* **C07c** *63/52, 69/76*

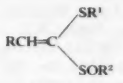
U.S. Cl. 260—340.5 **4 Claims**

1. A process for preparing a compound of the formula

$$RCH_2COOR^3$$

wherein R is a member selected from the group consisting of phenyl, halophenyl, methoxyphenyl, dimethoxyphenyl, methylenedioxyphenyl and phenyl substituted by alkyl of 1–3 carbon atoms and R^3 is hydrogen or alkyl of 1–10 carbon atoms,

which comprises reacting an unsaturated sulfoxide of the formula



wherein R has the same meaning as defined above, and each of R^1 and R^2 is, independently of each other, a member selected from the group consisting of alkyl of 1–3 carbon atoms and phenyl,

with a compound of the formula

$$R^3OH$$

wherein R^3 has the same meaning as defined above, in the presence of a mineral acid at a temperature of from −30° to 100°C.

3,910,959
1-(3,4-METHYLENEDIOXY-PHENYL)-4,4-DIMETHYL-PENT-1-EN-3-OL

Francois Marie Joseph Vallet, Paris, France, assignor to Unicler, Paris, France

Filed Feb. 27, 1973, Ser. No. 336,242

Claims priority, application France, Feb. 28, 1972, 72.06676

Int. Cl.[2] C07D *317/54*

U.S. Cl. 260—340.5 **1 Claim**

1. 1-(3,4-Methylenedioxy-phenyl)-4,4-dimethylpent-1-en-3-ol.

3,910,960
GULONIC ACID SALT

Jean Louis Molle, Villeurbanne St. Georges, and Jean Christian Boch, Neris les Bains, both of France, assignors to A.E.C. Societe de Chimie Organique et Biologique, Paris, France

Filed Sept. 13, 1973, Ser. No. 396,803

Claims priority, application France, Sept. 15, 1972, 72.32896

Int. Cl.[2] C07D *319/06;* **A01N** *9/28*

U.S. Cl. 260—340.7 **1 Claim**

1. Calcium diacetone-2-ketogulonate.

3,910,961
3,5-BIS-ETHYLENEDIOXY-13β-ALKYL-4,5-SECO-$\Delta^{9,1}$-[1]GONODIENE-17-ONES

Julien Warnant, Neuilly-sur-Seine, and Jean Jolly, Fontenay-sous-Bois, both of France, assignors to Roussel-UCLAF, Paris, France

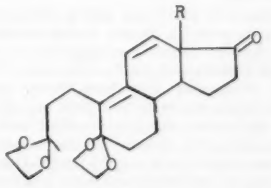
Division of Ser. No. 213,731, Dec. 29, 1971, Pat. No. 3,781,311. This application Sept. 24, 1973, Ser. No. 400,170

Claims priority, application France, Mar. 19, 1971, 71.09709

Int. Cl.[2] C07D *317/26*

U.S. Cl. 260—340.9 **2 Claims**

1. A compound of the formula



wherein R is alkyl of one to four carbon atoms.

3,910,962

STEREOSPECIFIC TOTAL STEROIDAL SYNTHESIS VIA SUBSTITUTED C/D-TRANS INDANONES

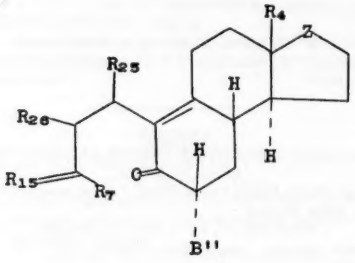
Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 765,023, Oct. 4, 1968. This application June 24, 1974, Ser. No. 482,823

Int. Cl.[2] C07D *317/26*

U.S. Cl. 260—340.9 4 Claims

1. A compound of the formula



wherein R_{15} is selected from the group consisting of oxo, lower alkylenedioxy or (hydrogen and lower alkoxy); B''is selected from the group consisting of lower alkoxycarbonyl, phenyloxy-carbonyl, cyano, lower alkyl sulfonyl; R_{25} and R_{26} are independently selected from the group consisting of hydrogen, hydroxyl and lower alkyl; Z is selected from the group consisting of carbonyl, lower alkylenedioxy methylene or $CH(OR_2)$; R_4 and R_7 are each lower alkyl and R_2 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy-lower alkyl, phenyl-lower alkyl, tetrahydropyranyl, lower alkanoyl, benzoyl, nitrobenzoyl, carboxy-lower alkanoyl, carboxy-benzoyl, trifluoroacetyl, or camphorsulfonyl.

3,910,963

METHOD FOR MANUFACTURE OF CARBOXYLIC ACIDS OR DERIVATIVES THEREOF

Yoshie Souma, Ibaragi, and Hiroshi Sano, Ikeda, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Sept. 6, 1973, Ser. No. 394,623

Claims priority, application Japan, Sept. 13, 1972, 47-92296; Sept. 29, 1972, 47-98367; Oct. 11, 1972, 47-102082; Oct. 12, 1972, 47-102464; Nov. 7, 1972, 47-111549

Int. Cl.[2] C07C *51/12, 51/14;* C07D *309/30*

U.S. Cl. 260—343 7 Claims

1. In a method for chemically adding carbon monoxide to olefins in strong acids for thereby manufacturing carboxylic acids or derivatives thereof corresponding to said starting materials, the improvement which comprises (1) having copper, copper compounds or mixtures thereof added in the presence of carbon monoxide to at least one strong acid selected from the group consisting of sulfuric acid, and boron fluoride complexes for thereby forming a metal carbonyl therein, (2) introducing said starting material into the strong acid containing the metal carbonyl in the presence of carbon monoxide at temperatures of 0°–50°C, and (3) separating from the resultant reaction solution a carboxylic acid or derivative aimed at.

3,910,964

PROCESS FOR PRODUCTION OF ISOCHROMANS

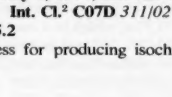
James Milton Sanders, Eatontown, and Loren Hall Michael, Freehold, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed May 1, 1974, Ser. No. 466,068

Int. Cl.[2] C07D *311/02*

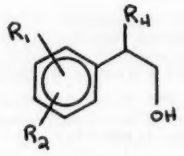
U.S. Cl. 260—345.2 10 Claims

1. In the process for producing isochromans having the structure:

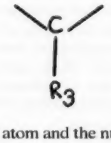


wherein R_1 and R_2 are each (i) separately, selected from the group consisting of hydrogen, lower alkoxyl, and lower alkyl, and (ii) taken together, when R_1 and R_2 are located at the "2" and "3" positions of the benzene ring, selected from the group consisting of benzo, cyclopentano, cyclohexano, naphtho, mono-lower alkyl cyclopentano, poly-lower alkyl cyclopentano, mono-lower alkyl cyclohexano and poly-lower alkyl cyclohexano, and R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen and lower alkyl comprising the steps of intimately admixing:

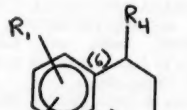
A. An aryl alkanol having the structure:



B. A methylenating-cyclizing agent capable of introducing the moiety:



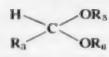
between the oxygen atom and the number "5" carbon atom of the structure:



C. A catalyst for the reaction between said aryl alkanol and said methylenating-cyclizing agent

and heating the resulting mixture for a period of time whereby a substantial amount of the isochroman having the above structure is formed; the improvement consisting of:

1. The methylenating-cyclizing agent being an acetal having the structure:



wherein R_5 and R_6 are the same or different straight chain lower alkyl;

2. The catalyst being a protonic acid selected from the group consisting of p-toluene sulfonic acid and phosphoric acid;
3. The reaction mass not containing at any time during or subsequent to the reaction any hydrogen chloride or corrosive halide salts or chloromethyl methyl ethers;
4. The reaction temperature being in the range of from 0° up to 200°C;
5. The acid concentration being from 1 up to 100% by weight based on the weight of the remainder of the reaction mass; and
6. The ratio of acetal to aryl alkanol being at least 0.1:1.

3,910,965

PROCESS FOR THE PREPARATION OF 2-FORMYLCYCLOPENTANE DERIVATIVES

Kiyoshi Sakai; Koichi Kojima; Takashi Yusa, and Hamako Katano, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

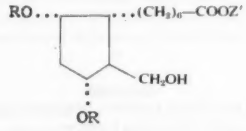
Division of Ser. No. 309,971, Nov. 28, 1972, abandoned. This application Dec. 18, 1973, Ser. No. 425,886

Claims priority, application Japan, Nov. 29, 1971, 46-96039

Int. Cl.² C07D *309/06*

U.S. Cl. 260—345.7 **3 Claims**

1. 2-Hydroxymethylcyclopentane derivative having the formula



wherein Z′ represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms and R represents a tetrahydropyranyl group.

3,910,966

NOVEL 3-THIA FURANS

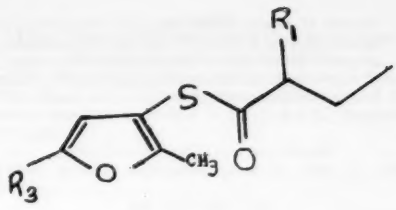
William J. Evers, Atlantic Highlands; Howard H. Heinsohn, Jr., Hazlet, and Bernard J. Mayers, Cliffwood Beach, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 386,453, Aug. 7, 1973, Pat. No. 3,872,111. This application June 11, 1974, Ser. No. 478,328The portion of the term of this patent subsequent to Mar. 18, 1992, has been disclaimed.

Int. Cl.² C07D *307/64*

U.S. Cl. 260—347.2 **5 Claims**

1. An ester of a 3-furanthiol having the structure:



wherein R_1' is selected from the group consisting of methyl and ethyl; and R_3 is selected from the group consisting of methyl and hydrogen.

3,910,967

PROCESS FOR THE PREPARATION OF TRIMETHYLBENZOQUINONE

Daniel Michelet, Tassin-la-demi-Lune, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Apr. 11, 1974, Ser. No. 460,203

Claims priority, application France, Apr. 16, 1973, 73.13711

Int. Cl.² C07C *49/64*

U.S. Cl. 260—396 R **9 Claims**

1. Process for the preparation of trimethylbenzoquinone, which comprises oxidizing isophorone in the presence of water with a thallium III salt of an inorganic acid, of a sulphonic acid, or of a carboxylic acid or with a complex of such a salt with 2,2′-dipyridyl or phenanthroline.

3,910,968

PREPARATION OF 3-OXO-19-NOR-Δ^4-STEROIDS FROM 10-[3-SUBSTITUTED-ALKYL]-DESA-STEROIDS

Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Falls, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

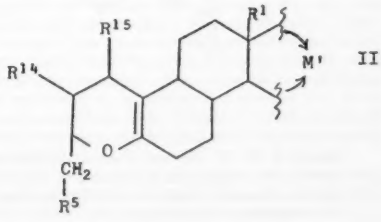
Filed Apr. 11, 1974, Ser. No. 459,981

Int. Cl.² C07D *317/06;* **C07J** *9/00*

U.S. Cl. 260—397.3 **5 Claims**

1. The process which comprises the steps of:

a. treating the compound



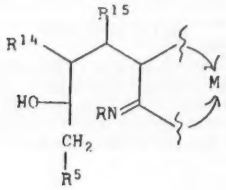
wherein M′ represents the remainder of the D ring of the steroid nucleus; R^{14} and R^{15} are each independently hydrogen or lower alkyl; R^5 is hydrogen or lower alkyl; and R^1 is primary lower alkyl containing from 1 to 5 carbons

with a reagent of the formula

$$NH_2R \qquad III$$

wherein R is hydroxy, lower alkoxy or a radical of the formula

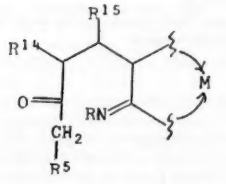
wherein X and Y are each independently lower alkyl or acid addition salt thereof, thereby obtaining a compound of the formula



IV

wherein R, R^5, R^{14}, R^{15} are defined as above and M represents the B, C and D rings of the steroid nucleus

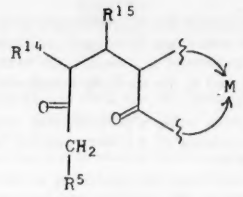
b. selectively oxidizing the compound of formula IV to yield a compound of the formula



V

wherein R, R^5, R^{14}, R^{15} and M are as defined above

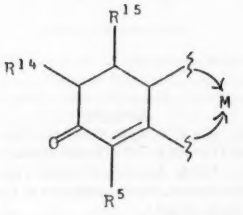
c. treating the compounds of formula V with a reaction partner containing a reactive carbonyl function to yield the compounds of the formula



VI

wherein R^5, R^{14}, R^{15} and M are defined as above

d. and then cyclizing the thus-obtained compounds of formula VI above to yield 3-oxo-Δ^4-19-nor-steroids of the formula



VII

wherein R^5, R^{14}, R^{15} and M are defined as above.

3,910,969

N-PHENYLSULFONAMIDO-N-PHOSPHONOMETHYL GLYCINE AND CERTAIN DERIVATIVES THEREOF

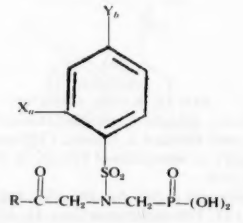
John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed June 28, 1974, Ser. No. 484,056

Int. Cl.² C07C *149/40*

U.S. Cl. 260—397.7 R **13 Claims**

1. A compound of the formula



wherein R is hydroxy, lower alkoxy or amino, X and Y are each independently halogen, amino, nitro, methyl, ethyl or methoxy, and *a* and *b* are each independently zero or one.

3,910,970

POLYALKYLENE POLYAMINE DERIVATIVES

Richard Hochreuter, Oberwil, and Joseph Rabinowitz, Geneva, both of Switzerland, assignors to Sandoz Ltd., Basle, Switzerland

Filed May 31, 1973, Ser. No. 365,606

Claims priority, application Germany, Nov. 30, 1972, 2258614

Int. Cl.[2] A23J 7/00; C07F 9/02

U.S. Cl. 260—403 5 Claims

1. A process for producing an N-acylated polyalkylene polyamine derivative which comprises reacting a compound of the formula

$$R_1 - CH_2 - NR_2H$$

in which R_1 is —COOH, —CH_2OH, —$CH_2OPO_3H_2$ or —$CHOHR_5$,

wherein R_5 is alkyl of 1 to 4 carbon atoms,

and R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, —CH_2COOH or —CH_2CH_2OH,

with x mols of a compound of the formula

$$HO_3SOCHR_3CH_2NR_4H$$

in which R_3 and R_4 each, independently, signifies hydrogen or alkyl of 1 to 4 carbon atoms,

x being an integer from 1 to 20, in the presence of at least $2x$ mols of alkali metal hydroxide and acylating the resulting product by reaction with a fatty acid of 8 to 22 carbon atoms or a perfluorated aliphatic carboxylic acid of 5 to 16 carbon atoms or a functional derivative of said acids.

3,910,971

BACTERIOSTATIC COMPOUNDS

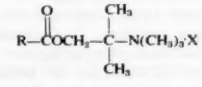
Jerry H. Hunsucker, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed July 12, 1974, Ser. No. 488,110

Int. Cl.[2] C07C 69/62, 69/63

U.S. Cl. 260—404 8 Claims

1. A compond corresponding to the formula:



where R is an aliphatic hydrocarbon group of from 7 to 17 carbon atoms and X is a halogen atom.

3,910,972

FATTY ACID ESTER MIXTURES LIQUID AT LOW TEMPERATURES AND PROCESS

Gerhard Dieckelmann, Hilden; Helmut Hartmann, Langenfeld, Rhineland, and Jurgen Plapper, Hilden, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

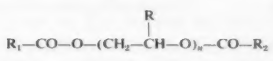
Filed Feb. 28, 1974, Ser. No. 446,680

Claims priority, application Germany, Mar. 8, 1973, 2311344

Int. Cl.[2] C09F 5/08

U.S. Cl. 260—410.6 9 Claims

1. Fatty acid esters liquid at low temperature having the formula



wherein R_1 — CO is the acyl of at least one fatty acid selected from the group consisting of (a) train-oil fatty acids and (b) liquid fatty acid mixtures containing trainoil fatty acids and containing from 10 to 60 per cent by weight of polyunsaturated fatty acids having 20 to 24 carbon atoms, CO-R_2 is the acyl of at least one liquid fatty acid substantially free of any polyunsaturated train-oil fatty acids and having more than 75 per cent by weight of unsaturated fatty acids selected from the group consisting of (i) monounsaturated fatty acids having 10 to 22 carbon atoms (ii) diunsaturated fatty acids having 10 to 22 carbon atoms, and (iii) mixtures thereof, R is a member selected from the group consisting of hydrogen and methyl, and n is an integer from 1 to 10, with the proviso that up to 20 mol percent of either R_1—CO or CO—R_2 can be replaced by hydrogen.

3,910,973

METHOD OF MANUFACTURING CARBOXYLATES

Hiroshi Isa, Funabashi; Takeshi Inomiya; Kenji Karube, both of Tokyo; Takeshi Takemoto, Ichikawa, and Masuzo Nagayama, Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1973, Ser. No. 327,247

Claims priority, application Japan, Jan. 31, 1972, 47-11571

Int. Cl.[2] C08H 17/36

U.S. Cl. 260—413 5 Claims

1. In a process which consists essentially of reacting at from 280° to 330°C, (A) a reactant selected from the group consisting of alcohols of the formula RCH_2OH, aldehydes of the formula RCHO and mixtures thereof, wherein R is alkyl, said alcohols and aldehydes having from 8 to 30 carbon atoms, with (B) at least about a stoichiometric amount of alkali metal compound selected from the group consisting of alkali metal oxides and alkali metal hydroxides, under oxidative dehydrogenation conditions, to transform said reactant (A) to an alkali metal carboxylate of the formula RCOOM, wherein R is as defined above and M is an alkali metal, the improvement which comprises

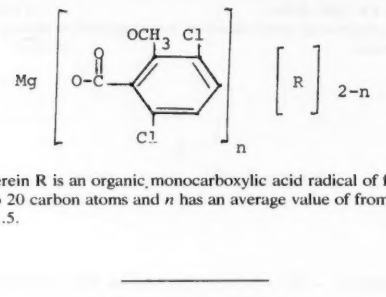
said reaction is carried out in the presence of a catalytically effective amount of titanium dioxide as the sole catalyst in the reaction system.

3,910,974
MIXED SALTS OF MAGNESIUM OF 2-METHOXY-3,6-DICHLOROBENZOIC ACID AND A CARBOXYLIC ACID

Takeo Hokama, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Oct. 15, 1973, Ser. No. 406,512
Int. Cl.[2] C11C *1/00*; A01M *9/24*
U.S. Cl. 260—413 **7 Claims**

1. A mixed salt of magnesium having the empirical formula:



wherein R is an organic monocarboxylic acid radical of from 7 to 20 carbon atoms and *n* has an average value of from 0.5 to 1.5.

3,910,975
PROCESS FOR THE CATALYTIC OXIDATION OF VICINAL DIOLS

Ulrich Zeidler, Dusseldorf-Benrath, and Herbert Lepper, Cologne-Mulheim, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Nov. 7, 1973, Ser. No. 413,689
Claims priority, application Germany, Nov. 20, 1972, 2256888
Int. Cl.[2] C08H *17/36*
U.S. Cl. 260—413 **6 Claims**

1. In the process for the oxidative cleavage of vicinal diols consisting of the steps of contacting a vicinal diol having from 6 to 35 carbon atoms in the liquid phase with an oxygen-containing gas in the presence of a cobalt ion catalyst and optionally an inert solvent and recovering carboxylic acids, the improvement consisting of conducting said oxidative cleavage reaction in the presence of an initiator selected from the group consisting of ethylene glycol, propane-diol-1,2, glycerol, diacetyl and acetylacetone.

3,910,976
HALO DERIVATIVES OF VANADIUM ORGANOPHOSPHATES

Marvin Michael Fein, Westfield, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 169,103, Aug. 4, 1971, abandoned. This application Feb. 28, 1974, Ser. No. 446,860
Int. Cl.[2] C07F *9/09*
U.S. Cl. 260—429 R **13 Claims**

1. A composition of matter represented by the formula:

$$(OV)\ [OP(O)_x(R_1O)_y(OR_2)_w]_2$$

wherein OV is a vanadyloxy group, R_1 is hydrogen, an alkyl or cycloalkyl having 1 to 16 carbon atoms or an aryl having up to 16 carbon atoms, R_2 is haloalkyl, pseudohaloalkyl, halocycloalkyl or pseudohalocycloalkyl, having 1 to 16 carbon atoms or a haloaryl or pseudohaloaryl having up to 16 carbon atoms, said halo being fluoro, chloro, iodo or bromo and said pseudohalo being cyano, cyanato or hydroxyl, *w* has a value of 0 or 1, *x* has a value of 0 or 1, *y* has a value of 1 or 2 and the sum of *x* and *y* is 2.

3,910,977
SALTS OF ANTIMONY (V) ESTERS AS FLAME RETARDANTS

Richard Norris Knowles, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 204,704, Dec. 3, 1971, Pat. No. 3,836,557. This application Jan. 22, 1974, Ser. No. 435,493
Int. Cl.[2] C07F *3/06*
U.S. Cl. 260—429.9 **1 Claim**

1. The divalent zinc salt of tri(ethylenedioxy)hydrogen antimony (V).

3,910,978
AQUEOUS SOLUBLE MIXED COMPLEX SALTS OF ALUMINUM ALIPHATIC ALCOHOL SULFATES

George W. Panzer, Timonium, Md., assignor to Alcolac, Inc., Baltimore, Md.

Filed May 31, 1973, Ser. No. 365,803
Int. Cl.[2] C07F *5/06*
U.S. Cl. 260—448 R **16 Claims**

10. A method of producing a soluble mixed complex aluminum salt comprising mixing aluminum sulfate with an aqueous solution having at least 10% by weight of an alkali metal, alkaline earth metal, or nitrogen containing base salt of an aliphatic alcohol sulfate having 1 to 30 carbon atoms, the moles of aluminum sulfate used per mole of neutralized salt being between about 0.001 to 6.

16. An aqueous solution containing a precipitate of the formula:

$$[R—OSO_3]_pAl{\cdot}Z[M_r(SO_4)_x]$$

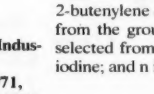
wherein R is the radical of an aliphatic alcohol having from 1 to 30 carbon atoms, M is a cation having a valence of *x*, selected from the group consisting of alkali metal, alkaline earth metal, and nitrogen containing base radicals, *x* is 1 or 2, *p* is from 0.167 to 6; Z is a number less than 1; *r* is 1 or 2; *r* is 1 when *x* is 2 and *r* is 2 when *x* is 1.

3,910,979
ORGANO HALOALUMINUM COMPOUNDS

Scott H. Eidt, Seabrook, Tex., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 364,442, May 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 166,974, July 28, 1971, abandoned. This application Jan. 31, 1974, Ser. No. 438,911
Int. Cl. C07f *5/06*
U.S. Cl. 260—448 A **14 Claims**

1. A composition of matter having the formula:



wherein Z is selected from the group consisting of ethylene, 2-butenylene and alkyl substituted 2-butenylene; Y is selected from the group consisting of alkyl and aryl; X is a halogen selected from the group consisting of chlorine, bromine and iodine; and n is an integer of at least 1 and can range up to 20.

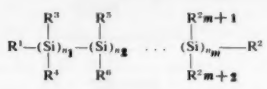
3,910,980
PROCESS FOR PREPARING MONOSILANES FROM POLYSILANES

Yoichiro Nagai; Iwao Ojima, and Shinichi Inaba, all of Sagamihara, Japan, assignors to (Zaidanhojin) Sagami Chemical Research Center, Tokyo, Japan

Filed Feb. 25, 1974, Ser. No. 445,651
Claims priority, application Japan, Feb. 28, 1973, 48-23151; Mar. 14, 1973, 48-28984
Int. Cl. C07f *7/18*
U.S. Cl. 260—448.8 R **17 Claims**

1. A process for producing hydrogen-substituted alkoxy monosilane which comprises:

A. reacting (1) a polysilane of the formula



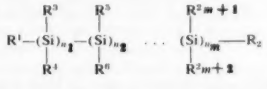
in which all R's may be the same or different and is selected from the group consisting of hydrogen, alkyl, alkenyl, aralkyl, aryl, silyl and alkoxy, and n_m is an integer and m is a natural number wherein the sum $n_1 \ldots n_m$ is at least 2, with (2) an alcohol of the formula ROH in which R is an alkyl radical selected from the group consisting of methyl, ethyl, isopropyl, n-propyl, n-butyl and benzyl,

B. heating the resulting mixture to a temperature of at least 25°C in the presence of (3) a catalytically effective amount of an organorhodium coordination complex in which the rhodium portion is coordinated to a ligand selected from the group consisting of phosphine ligands, phosphite ligands, aminophosphine ligands, carbonyl ligands, carbonyl phosphine ligands, olefin ligands and diene ligands,

C. recovering the corresponding alkoxysilane.

11. The process for producing hydrogen-substituted phenoxy monosilanes which comprises:

A. reacting (1) a polysilane of the formula



in which all R's may be the same or different and selected from the group consisting of hydrogen, alkyl, alkenyl, aralkyl, aryl, silyl or alkoxy, n_m is an integer and m is an integer, wherein the sum $n_1 \ldots n_m$ is at least 2, with (2) a phenolic compound.

B. heating the resulting mixture to at least 25°C in the presence of (3) a catalytically effective amount of an organorhodium coordination complex in which the rhodium portion is coordinated to a ligand selected from the group comprising phosphine ligands, phosphite ligands, aminophosphine ligands, carbonyl ligands, carbonyl phosphine ligands, olefin ligands and diene ligands,

C. recovering the corresponding phenoxysilane.

3,910,981
NITROALKYL NITRATES

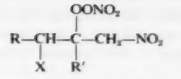
William M. Cummings, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 311,993, Dec. 4, 1972, Pat. No. 3,853,944, which is a division of Ser. No. 144,212, May 17, 1971, Pat. No. 3,732,283. This application Jan. 2, 1974, Ser. No. 430,306The portion of the term of this patent subsequent to May 8, 1990, has been disclaimed.

Int. Cl.² C07C *77/02*

U.S. Cl. 260—453 R **5 Claims**

1. A nitroalkyl nitrate characterized by the formula:



where R and R′ are hydrogen or alkyl of from 1 to 10 carbons, where X is a member selected from the group consisting of R^2O—, Cl and phenyl, and where R^2 is alkyl of from 1 to 10 carbons or phenyl.

3,910,982
ALKYLSULFONIC ACID ESTERS OF 1,3,2-OXAZAPHOSPHA-CYCLIC COMPOUNDS

Herbert Arnold, Heidelberg; Friedrich Bourseaux, Brackwede; Jurgen Potel, Gadderbaum, and Norbert Brock, Uerentrup, all of Germany, assignors to Asta-Werke Aktiengesellschaft, Brackwede, Westphalia, Germany

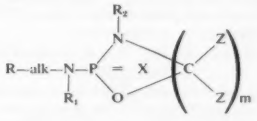
Division of Ser. No. 225,273, Feb. 10, 1972, Pat. No. 3,828,090. This application Jan. 24, 1974, Ser. No. 436,173

Claims priority, application Germany, Feb. 19, 1971, 2107936; Jan. 14, 1972, 2201675

Int. Cl.² C07C *143/00*

U.S. Cl. 260—456 A **4 Claims**

1. Alkyl sulfonic acid esters of 1,3,2-oxazaphosphacyclic compounds of formula I



I

wherein R represents a halogen atom, R_1 is hydrogen, and R_2 is a lower alkyl group having from 1 to 4 carbon atoms which is substituted with a lower alkyl sulfonic acid ester group having a straight or branched lower alkyl group with 1 to 6 carbon atoms, and alk represents a straight or branched alkylene group having 2 or 3 carbon atoms in the chain and, if branched, having a total number of 3 or 4 carbon atoms, X represents oxygen, Z represents hydrogen, and m is 3.

3,910,983
PROCESS FOR THE PRODUCTION OF CHLOROFORMIC ESTERS

Karl Merkel; Joachim Datow; Juergen Paetsch, all of Ludwigshafen; Herwig Hoffmann, Frankenthal, and Siegfried Winderl, Heidelberg, all of Germany, assignors to BASF Aktiengellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 17, 1973, Ser. No. 407,297

Claims priority, application Germany, Oct. 19, 1972, 2251206

Int. Cl.² C07C *68/00*

U.S. Cl. 260—463 **8 Claims**

1. In a process for production of a chloroformate of a monohydric or polyhydric alcohol by the exothermic reaction of equivalent quantities of phosgene and a monohydric alcohol having 1–20 carbon atoms or a polyhydric alcohol having 2–20 carbon atoms in a reactor wherein the reaction mixture is composed of said alcohol, phosgene, the chloroformate of said alcohol and hydrogen chloride which is liberated in the reaction, the temperature of the reaction being maintained above 0°C. and not exceeding 30°C by cooling the reaction mixture, the mean residence time of the reactants in said reactor being 5–30 minutes, the improvement which comprises continuously adding said alcohol and said phosgene to the reaction mixture under conditions of fluid movement in the reactor wherein the added alcohol is homogeneously distributed into the reaction mixture in less than 5 seconds after its addition thereto, maintaining throughout the reaction mixture a concentration of said alcohol which never exceeds

3% by weight, based on the reaction mixture, at points beyond the distance traveled by the alcohol in the reaction mixture in 5 seconds, and also maintaining a phosgene concentration of at least 20% by weight in the reaction mixture at all times.

3,910,984

BENZYLCYANO-AMIDES

Manasse Nussim, Netanya; Ezra Levy, Petah-Tikva, and Jacob Naiman, Netanya, all of Israel, assignors to Plantex, Ltd., Netanya, Israel

Filed Nov. 27, 1972, Ser. No. 309,758

Int. Cl.² C07C *121/75*

U.S. Cl. 260—465 D **1 Claim**

1. α-cyano-3,4,5-trimethoxy-dihydrocinnamamide.

3,910,985

PROCESS FOR PREPARING FLUOROANILINES

Paulus P. Montijn, and Albertus J. Mulder, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

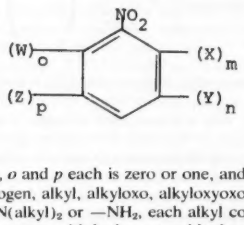
Filed July 15, 1974, Ser. No. 488,643

Claims priority, application United Kingdom, Aug. 2, 1973, 36733/73

Int. Cl.² C07C *101/54*

U.S. Cl. 260—471 R **7 Claims**

1. A process for preparing 4-fluoroanilines, which comprises treating at a temperature above about 25°C a nitrobenzene of the formula



wherein *m*, *n*, *o* and *p* each is zero or one, and W, X, Y and Z each is halogen, alkyl, alkyloxo, alkyloxyoxo, carboxyl, —NH alkyl, —N(alkyl)$_2$ or —NH$_2$, each alkyl containing from 1 to 6 carbon atoms, with hydrogen and hydrogen fluoride in the presence of

a. at least one hydrogenation catalyst selected from the noble metals of group VIII of the Periodic Table of the Elements, and their oxides,

b. liquid hydrogen fluoride, and

c. at least one fluorine-containing acid selected from tetrafluoroboric acid, hexafluorophosphoric acid, hexafluoroarsenic acid, hexafluoroantimoic acid, hexafluorotitanic acid, hexafluorostannic acid, hexafluorotantalic acid, hexafluoroniobic acid and hexafluorosilicic acid, the molar ratio of hydrogen fluoride to nitrobenzene reactant being at least 1.0, the hydrogen pressure being from about 0.1 to about 10 bars, absolute, and the amount of liquid hydrogen fluoride being sufficient to provide a mobile fluid reaction mixture.

3,910,986

PROCESS FOR OXIDIZING BETA-ACYLOXYETHYL-TOLUATES

Charles N. Winnick, Teaneck, N.J., assignor to Halcon International, Inc., New York, N.Y.

Filed Jan. 12, 1972, Ser. No. 217,260

Int. Cl.² C07C *69/82*

U.S. Cl. 260—475 P **13 Claims**

1. A process comprising the step of oxidizing a beta-acyloxyethyltoluate, the acyl moiety of which is formyl, acetyl or propionyl by contacting said toluate in the liquid phase with molecular oxygen in the presence of a solvent inert under reaction conditions while controlling the content of water in the reaction mixture so that it is at a value below 6% by weight at all times during the oxidizing step.

3,910,987

SUBSTITUTED NITROALKYL PEROXYNITRATE

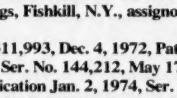
William M. Cummings, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 311,993, Dec. 4, 1972, Pat. No. 3,853,944, which is a division of Ser. No. 144,212, May 17, 1971, Pat. No. 3,732,283. This application Jan. 2, 1974, Ser. No. 430,305The portion of the term of this patent subsequent to May 8, 1990, has been disclaimed.

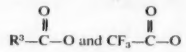
Int. Cl.² C07C *77/02*, *79/18*

U.S. Cl. 260—476 R **8 Claims**

1. A nitroalkyl peroxynitrate characterized by the formula:



where R and R′ are hydrogen or alkyl of from 1 to 10 carbons and where X is a member selected from the group consisting of



and R^3 is hydrogen, phenyl or alkyl of from 1 to 10 carbons.

3,910,988

ESTERS OF γ-GLUTAMYL AMIDE OF DOPAMINE

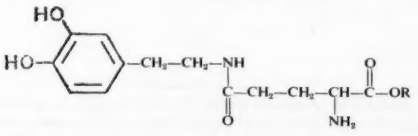
Peter Hadley Jones, Lake Forest; Jaroslav Kyncl, Lake Bluff; Carroll Wayne Ours, Zion, and Pitambar Somani, Libertyville, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 23, 1973, Ser. No. 408,901

Int. Cl.² C07C *103/50*

U.S. Cl. 260—471 A **2 Claims**

1. Esters of γ-glutamyl amide of dopamine selected from the group consisting of



where R is a C_1–C_{18} straight or branched chain alkyl radical and a pharmaceutically acceptable acid addition salt thereof.

3,910,989

N-TRIIODOBENZYL-CARBAMIC ACID DERIVATIVES

Ernst Felder, and Davide Pitre, both of Milan, Italy, assignors to Bracco Industria Chimica, Societa per Azioni, Milan, Italy

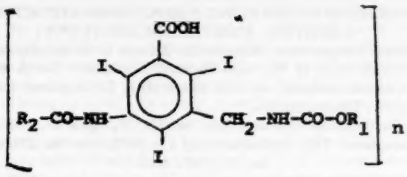
Filed June 24, 1974, Ser. No. 482,665

Claims priority, application Switzerland, July 17, 1973, 10450/73

Int. Cl.² C07C *125/06*

U.S. Cl. 260—471 C **9 Claims**

1. A compound which is an N-(2,4,6-triiodo-3-acylamino-5-carboxy-benzyl)-carbamic acid ester of the formula



or a water-soluble salt of said ester with a pharmaceutically acceptable base, in said formula

n being 1 or 2,

R_1 having up to four carbon atoms and being alkyl, hydroxyalkyl, or alkoxyalkyl when *n* is 1, and said R_1 being divalent alkylene or oxaalkylene having one to five carbon atoms and up to two oxygen atoms when *n* is 2, and

R_2 having up to three carbon atoms and being alkyl, hydroxyalkyl, or alkoxyalkyl.

3,910,990

LIQUID, CARBOXYL-TERMINATED POLYMERS

James Melvin Meyer, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 31, 1973, Ser. No. 411,430

Int. Cl.² C07C *55/00, 55/22, 69/34*

U.S. Cl. 260—478 **13 Claims**

1. A process for preparing a liquid polymeric composition containing on the average about 1.8–3.0 carboxylic groups attached to a substantially saturated hydrocarbon backbone, said composition having a number average molecular weight of about 750–7,000, said process comprising the following sequential steps:

1. dissolving in carbon tetrachloride a high molecular weight random copolymer selected from ethylene/propylene dipolymers and EPDM copolymers, the proportion of propylene in the copolymer being about 25–80 weight percent, and
2. subjecting the solution resulting from step (1) above, to ozone at a temperature of about 15°–50°C. during a period of about 1–30 hours.

3,910,991

2-ALKINYLOXYPHENYLCARBAMATES

Erwin Nikles, Liestal, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

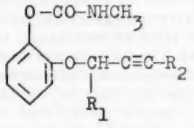
Continuation of Ser. No. 885,331, Dec. 15, 1969, abandoned. This application June 6, 1974, Ser. No. 476,963

Claims priority, application Switzerland, Dec. 20, 1968, 19031/68

Int. Cl.² C07C *125/06*

U.S. Cl. 260—479 C **5 Claims**

1. A compound of the formula



in which the substituents R_1 and R_2, independently of each other, each represents an alkyl group containing 1 to 4 carbon atoms or in which one of the two substituents may also represent a hydrogen atom.

3,910,992

LIQUID VINYLIDENE-TERMINATED POLYMERS

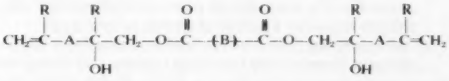
Douglas E. Skillicorn, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sept. 28, 1972, Ser. No. 292,926

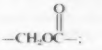
Int. Cl.² C07C *69/34*

U.S. Cl. 260—485 G **3 Claims**

1. A liquid vinylidene-terminated polymer having a molecular weight of from about 1,000 to about 20,000 of the structure



wherein B is a polymeric backbone of carbon-carbon linkages and consisting of polymerized units of dienes containing 4 to about 10 carbon atoms; A is selected from the group consisting of



—CH_2OCH_2—, and —CH_2O—; and R is hydrogen or an alkyl radical containing 1 to 4 carbon atoms.

3,910,993

ARYL PHOSPHONOUS ACIDS USEFUL AS U.V. STABILIZERS

Lajos Avar, Binningen, and Kurt Hofer, Munchenstein, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

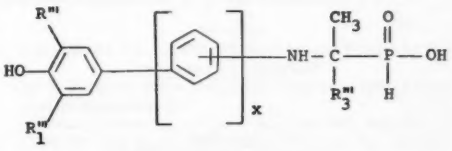
Filed June 21, 1973, Ser. No. 371,992

Claims priority, application Switzerland, June 23, 1972, 9511/72; July 7, 1972, 10194/72

Int. Cl.² C07F *9/48*

U.S. Cl. 260—502.5 **9 Claims**

1. A compound of the formula



wherein R''' is tertiary alkyl of 4 to 6 carbon atoms,

R_1''' is hydrogen or tertiary alkyl of 4 to 6 carbon atoms,

R_3''' is alkyl of up to 2 carbon atoms, and

x is 0 or 1.

3,910,994

ALKYLAROMATIC SULFONATE DETERGENT PROCESS

Herman S. Bloch, Skokie; George E. Illingworth, Arlington Heights, and George W. Lester, Park Ridge, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation of Ser. No. 275,380, July 26, 1972, abandoned, which is a division of Ser. No. 787,268, Dec. 26, 1968, Pat. No. 3,681,442. This application June 3, 1974, Ser. No. 476,007The portion of the term of this patent subsequent to Aug. 1, 1989, has been disclaimed.

Int. Cl.² C07C *143/24*

U.S. Cl. 260—505 A **2 Claims**

1. A process for producing an alkylaromatic sulfonate containing a C_9—C_{18} linear alkyl group which comprises the steps of:

a. monohalogenating a C_9—C_{18} n-paraffin by contacting bromine or chlorine with an excess of said n-paraffin to

form a C_9—C_{18} linear monohalogenated n-paraffin, recovering from the resultant monohalogenation effluent said C_9—C_{18} linear monohalogenated paraffin in admixture with unreacted C_9—C_{18} n-paraffin, said unreacted C_9—C_{18} n-paraffin being present in an amount of from about 20 to about 96 wt.% of C_9—C_{18} monohalogenated paraffin;

b. alkylating a monocyclic aromatic selected from the group consisting of benzene, lower alkyl substituted benzene, phenol and mono-nitrobenzene with said C_9—C_{18} linear monohalogenated n-paraffin in admixture with the unreacted C_9—C_{18} n-paraffin to form an alkylaromatic containing a C_9—C_{18} linear alkyl group;

c. separating unreacted monocyclic aromatic from the resultant effluent of step (b) which contains said unreacted monocyclic aromatic, C_9—C_{18} linear alkylaromatic, and C_9—C_{18} n-paraffin;

d. sulfonating the alkylaromatic of step (c) in admixture with the C_9—C_{18} n-paraffin of step (c), with an acidic sulfonating agent to form an alkylaromatic sulfonic acid, said acidic sulfonating agent being selected from the group consisting of sulfuric acid and oleum and being present in an amount in excess of the stoichiometric quantity required to sulfonate said alkylaromatic;

e. separating the resultant sulfonation mixture into an acid phase containing excess acidic sulfonating agent and a hydrocarbon phase containing said C_9—C_{18} n-paraffin and said alkylaromatic sulfonic acid;

f. neutralizing the hydrocarbon phase by admixing that phase with an aqueous solution of a base selected from the group consisting of ammonia and the hydroxides and carbonates of sodium, potassium, lithium and magnesium to form a swater-soluble neutralized alkylaromatic sulfonate;

g. forming a hydrocarbon phase containing unreacted C_9—C_{18} n-paraffin, and an aqueous phase containing water-soluble neutralized aromatic sulfonate;

h. separating the phases formed in step (g);

i. recovering water-soluble alkylaromatic sulfonate from the aqueous phase; and,

j. recycling at least a portion of the separated unreacted C_9—C_{18} n-paraffin of step (g) to monohalogenation step (a).

3,910,995

PROCESS FOR PREPARING 2,5-DIHALO-3-NITROBENZOIC ACID

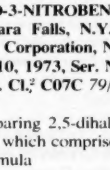
Samuel Gelfand, Niagara Falls, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,681

Int. Cl.[2] C07C *79/46*

U.S. Cl. 260—515 A **10 Claims**

1. A process of preparing 2,5-dihalo-3-nitro benzoic acid and derivatives thereof which comprises the steps of reacting a compound of the formula



wherein X and Y are hologen and Z is selected from the group consisting of halogen and anhydride, namely 2,5 dihalobenzoyloxy-, without an intermediate hydrolysis step, with a sulfur-containing compound selected from the group consisting of sulfur trioxide, oleum, chloro-sulfonic acid and mixtures thereof and a nitrating agent.

3,910,996

PROCESS FOR OXIDIZING A BENZENOID STRUCTURE CARRYING A METHYL SUBSTITUENT

Anatoli Onopchenko, Monroeville; Johann G. D. Schulz, Pittsburgh, both of Pa., and Richard Seekircher, North Bay, Canada, assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 32,335, April 27, 1970, abandoned. This application July 11, 1972, Ser. No. 270,684

Int. Cl. C07c *63/04*

U.S. Cl. 260—524 R **14 Claims**

1. A process for selectively oxidizing the methyl substituent on a benzenoid structure carrying a nuclear methyl substituent and a higher alkyl substituent, said higher substituent being one wherein the carbon attached to the benzenoid structure carries secondary or tertiary hydrogens which comprises heating said benzenoid structure with molecular oxygen in the presence of a catalyst consisting essentially of cobaltic ions in a lower carboxylic acid at a temperature of about 50° to about 200° C., said cobaltic ions being present in an amount of about one to about 5 percent by weight based on said lower carboxylic acid.

3,910,997

PROCESS FOR CLEANING SLURRY COOLERS

Anders E. Andersen, Berwyn; Alan R. Hirsig, Wallingford; Walter A. Mameniskis, Drexel Hill, and Frank W. Melpolder, Wallingford, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed July 28, 1971, Ser. No. 167,028

Int. Cl.[2] C07C *51/33*

U.S. Cl. 260—524 R **4 Claims**

1. The process for operating a heat exchanger wherein a reaction system comprising a slurry is cooled by passing said slurry through one side of said heat exchanger and passing a cooler liquid through the other side of said heat exchanger, the improvement which consists of:

regulating the composition of said slurry by conducting the oxidation of metaxylene by air to isophthalic acid in an aqueous acetic acid solvent containing a solution of cobalt as catalyst, said slurry tending to deposit plating deposits of slurried material onto the surface of the process side of the exchanger, said plating deposits comprising organic compounds and acids;

regulating the temperature of the reaction system in the heat exchanger to maintain a reaction temperature of from about 200°F. to 275°F. by circulating cooling water in said heat exchanger; and

operating the heat exchanger in an improved manner by periodically substituting low pressure steam for said cooling water to remove plating deposits of slurried material from the surface of the process side of the exchanger, the temperature of the low pressure steam being less than the melting point of isophthalic acid but sufficiently hot to alter the adhesion of such deposits to permit such deposits to become dispersed and withdrawn as a component of withdrawn slurry, said low pressure steam heating the heat exchanger and circulating slurry to a temperature of about 200°F.

3,910,998

PROCESS FOR PREPARATION OF SUBSTANTIALLY REFINED METHYLTEREPHTHALIC ACID AND/OR 4-METHYLISOPHTHALIC ACID

Gentaro Yamashita; Takeshi Fujii, and Noritsugu Saiki, all of Iwakuni, Japan, assignors to Teijin Limited, Osahu, Japan

Filed Apr. 12, 1971, Ser. No. 133,431

Int. Cl.[2] C07C *51/42*

U.S. Cl. 260—525 **6 Claims**

1. A process for the preparation of a substantially refined methylbenzene dicarboxylic acid selected from methylterephthalic acid and 4-methylisophthalic acid, which comprises mixing a solid crude product of at least one methylbenzene dicarboxylic acid selected from the group consisting of me-

thylterephthalic acid and 4-methylisophthalic acid, which is obtained by oxidizing pseudocumene with molecular oxygen in the presence of a cobalt catalyst, with acetic acid or an aqueous solution of acetic acid in an amount sufficient to dissolve the methylbenzene dicarboxylic acid substantially therein, the water content of said aqueous solution of acetic acid being up to 40% by weight; thereby dissolving the methylbenzene dicarboxylic acid in said acetic acid or said aqueous solution of acetic acid at a temperature of 80° – 220°C. while leaving substantially in the undissolved state impure coloring materials contained in said solid crude product; separating the undissolved solids from the resulting liquid by passing through a filtering layer which does not substantially allow particles of a size greater than 10 microns to pass therethrough while maintaining the temperature at 80° – 220°C.; and recovering the methylbenzene dicarboxylic acid in the form of solids from the remaining solution.

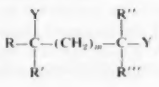
3,910,999

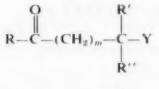
OXIDATION OF MIXTURES OF ORGANIC COMPOUNDS WITH HYPOCHLORITE ION SOURCE MATERIALS

John R. Moyer, and Charles S. Parmele, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

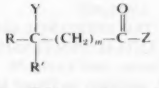
Filed June 25, 1973, Ser. No. 373,069
Int. Cl.² C07C *51/26, 51/16*
U.S. Cl. 260—531 R **11 Claims**

1. A method of treating an aqueous mixture of pH of about neutral or greater containing a mixture of different organic compounds, wherein the organic compounds are selected from the group consisting of





, or



where

R, R′, R″, R‴ = C_nH_{2n+1} where n = 0 to 10, m = 0 to 3, Y = Cl or OH, and Z = H, OH, ONa, OMg, OCa, OK, or OAl, at least one of which compounds is most favorably oxidized individually with hypochlorite ions at acidic pH values, and at least one other of which compounds is most favorably oxidized individually with hypochlorite ions at neutral to alkaline pH values, comprising oxidizing a substantial portion of said organics with hypochlorite ions at a temperature between about 70°C and the boiling point of the mixture to form a sufficient amount of acidic byproducts to drive the pH of said aqueous mixture below neutral.

3,911,000

METHOD FOR PREPARING DICARBOXYLIC ACIDS

Stanislav Dmitrievich Razumovsky, Vorobievskoe shosse, 11, kv. 68; Gennady Efremovich Zaikov, ulitsa Novatorov, 40, korpus 12, kv. 46, both of Moscow; Dmitry Vasilievich Mushenko, ulitsa Krasnaya, 40, kv. 12, Leningrad; Vladimir Leonidovich Klimenko, Fontanka, 66, kv. 29, Leningrad; Viktor Karlovich Tsyskovsky, Kanal Griboedova, 22, kv. 6, Leningrad, and Jury Nikolaevich Juriev, ulitsa Kurskaya, 31, kv. 14, Leningrad, all of U.S.S.R.

Filed Mar. 23, 1972, Ser. No. 237,500
Int. Cl.² C07C *55/14, 51/18*
U.S. Cl. 260—533 C **14 Claims**

1. A method for preparing an unsubstituted aliphatic α,ω-dicarboxylic acid having 6 to 12 carbon atoms comprising oxidizing an unsubstituted saturated cyclic hydrocarbon having 6 to 12 carbon atoms in the ring with ozone in an ozone-containing gas containing 1 to 8 percent by volume of ozone in the presence of a salt of a metal having variable valence selected from the group consisting of copper, nickel, chromium, manganese and cobalt.

3,911,001

PROCESS FOR THE PREPARATION OF LYSINE INVOLVING 1-UREIDO-4-CYANOVALERAMIDE AND 1-REIDO-5-AMINOCAPRONAMIDE INTERMEDIARIES

Geertrudes H. Suverkropp, Geleen, and Werner Reichrath, Stein, both of Netherlands, assignors to Stamicarbon N.V., Geleen, Netherlands

Continuation of Ser. No. 211,713, Dec. 23, 1971, abandoned. This application Apr. 6, 1973, Ser. No. 348,519
Claims priority, application Netherlands, Dec. 23, 1970, 7018704The portion of the term of this patent subsequent to Sept. 11, 1990, has been disclaimed.
Int. Cl.² C07C *99/08*
U.S. Cl. 260—534 L **6 Claims**

1. A process for the preparation of lysine or a salt thereof, said process consisting essentially in hydrogenating a reaction mixture of 5-(3-cyanopropyl)-hydantoin and 0.1 to 0.25 mole of 1-ureido-4-cyanovaleramide per mole of 5-(3-cyanopropyl)-hydantoin at a temperature of 50°–300°C in the liquid phase in an inert solvent under a partial hydrogen pressure of 1 to 200 atmospheres and in the presence of a hydrogenation catalyst, said hydrogenation resulting in a hydrogenated product of a mixture of 5-(4-aminobutyl)-hydantoin and 1-ureido-5-aminocapronamide, and subsequently hydrolyzing said hydrogenated product in the liquid phase at temperatures of 80°–250°C thereby forming said lysine or a salt thereof.

3,911,002

3-CARBAMOYL-3-HYDROXY-4-HALOBUTYRIC ACID AND SALTS THEREOF

Karl E. Wiegand, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 172,627, Aug. 18, 1971, Pat. No. 3,769,337. This application Apr. 4, 1973, Ser. No. 347,822
Int. Cl.² C07C *103/167*
U.S. Cl. 260—534 M **5 Claims**

1. 3-carbamoyl-3-hydroxy-4-halobutyric acid and the alkali metal, alkaline earth metal and ammonium salts thereof.

3,911,003

PROCESS FOR THE PRODUCTION OF GLYCOLIC ACID AND OXYDIACETIC ACID

Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 19, 1974, Ser. No. 480,894
Int. Cl.² C07C *59/06*
U.S. Cl. 260—535 R **6 Claims**

1. A process for producing hydroxyacetic acid which comprises contacting carbon monoxide with formaldehyde and a catalyst consisting essentially of hydrogen fluoride in a reaction zone and under reaction conditions effective to form hydroxyacetic acid, including a temperature between 0° and 100°C. and a carbon monoxide partial pressure between 10 and 4000 psig.

3,911,004
PRODUCTION OF SUBSTITUTED ALKANES

Otto Hertel; Helmut Schlecht, both of Ludwigshafen, and Rolf Schneider, Mannheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 30, 1973, Ser. No. 346,404

Claims priority, application Germany, Apr. 12, 1972, 2217530

Int. Cl.[2] C07C *143/70, 17/10*

U.S. Cl. 260—543 R **20 Claims**

1. A process for chlorination and/or sulfochlorination of alkanes to produce, as reaction products, chloroalkanes, alkane sulfochlorides, and/or chloroalkane sulfochlorides which comprises passing in a liquid phase an alkane having more than five carbon atoms upwardly in the form of a lower, thin layer of the liquid phase through a tubular reaction zone having its longitudinal axis inclined in the range of 2° to 30° relative to the horizontal at a throughput of 0.1 to 20 kilograms of said alkane per hour per liter of reaction space in said reaction zone, and passing chlorine gas or both chlorine gas and sulfur dioxide gas concurrently upwardly through said tubular reaction zone as an upper gas layer at a throughput of said gases in the range of 0.1 to 20 kilograms per hour per liter of reaction space in said reaction zone and at a velocity of said gases in the range of 2 to 30 meters per second, said velocity being sufficient to convey said liquid phase upwardly through the reaction zone with a residence time of said gases in said reaction zone in the range of 2 seconds to 1 minute.

3,911,005
1,3,2-DIAZAPHOSPHOLIDINE COMPOUNDS

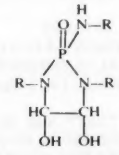
Philip R. Schenkenberg, Glendale, and Charles R. Williams, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 12, 1974, Ser. No. 505,392

Int. Cl.[2] C07F *9/22*

U.S. Cl. 260—551 P **4 Claims**

1. A compound represented by the structure



where all R substituents are identical and are methyl or ethyl.

3,911,006
PROCESS FOR THE PREPARATION OF TRISUBSTITUTED UREAS

Colin John Hearsey, Surbiton, England, assignor to Quimco GmbH, Zuerich, Switzerland

Filed Mar. 30, 1973, Ser. No. 346,480

Claims priority, application United Kingdom, Apr. 5, 1972, 15677/72; Apr. 18, 1972, 17872/72; May 5, 1972, 21063/72

Int. Cl.[2] C07C *127/19*

U.S. Cl. 260—553 A **3 Claims**

1. A process for preparing a trisubstituted urea of the formula:

$$R(NHCONR'R'')_n$$

in which R is a substituted or unsubstituted mono-, di- or polyvalent aromatic radical, R′ is a substituted or unsubstituted monovalent aliphatic or aromatic radical and R″ is a substituted or unsubstituted monovalent aliphatic radical or R′ and R″ together represent a substituted or unsubstituted divalent radical in which at least one of the two carbon atoms adjoining the nitrogen atom of the urea is aliphatic, and n is an integer, wherein an aromatic nitrocompound of the general formula:

$$R(NO_2)_n$$

is reacted with a secondary ammonium N,N-disubstituted thiolcarbamate of the formula:

$$R'R''NCOS^-.N^+H_2R'R''.$$

3,911,007
N-SUBSTITUTED N-BENZYLOXY-2-METHYL-2-(4-HALOPHENOXY)PROPIONAMIDES

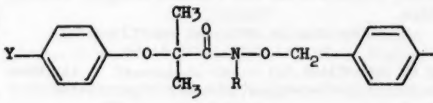
William K. Sprenger, Arlington Heights, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Aug. 8, 1974, Ser. No. 495,859

Int. Cl.[2] C07C *103/32*

U.S. Cl. 260—559 B **9 Claims**

1. A compound of the formula



wherein X is hydrogen, (lower alkoxy) containing 1–7 carbon atoms, halo, or phenyl; Y is halo; and R is hydrogen, (lower alkoxy)carbonyl, (lower alkanoyl) containing 1–7 carbon atoms or benzoyl.

3,911,008
POLAR-SUBSTITUTED PROPANOLAMINES AS ANTI-ANGINA AND ANTI-HYPERTENSIVE AGENTS

Michael N. Edinberry, Dover, and Grant W. McLay, Sandwich, both of England, assignors to Pfizer Inc., New York, N.Y.

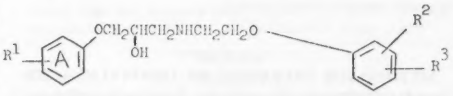
Filed Aug. 15, 1974, Ser. No. 497,625

Claims priority, application United Kingdom, Aug. 18, 1973, 39162/73

Int. Cl.[2] C07C *103/28*

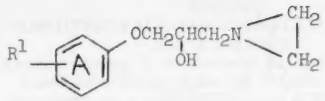
U.S. Cl. 260—559 A **5 Claims**

1. A process for preparing propanolamine derivatives of the formula:



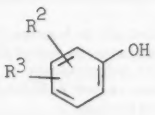
(I)

wherein R^1 is hydrogen or halogen atom, or a lower alkyl, lower alkenyl, lower alkoxy or lower alkenoxy group; R^3 is a hydrogen or halogen atom, or a lower alkyl or lower alkoxy group; R^2 is an electron-withdrawing polar substituent selected from the group consisting of $CONR^9R^{10}$ and $CONHNR^9R^{10}$ wherein R^9 and R^{10} are each hydrogen or lower alkyl; and wherein benzene ring A may be replaced by a naphthalene ring; which process comprises reacting an N-substituted aziridine of the formula:



(II)

with a substituted phenol of the formula:



(III)

in a reaction inert solvent at a temperature of from about 20° to the reflux temperature of the solvent until reaction is substantially complete, and isolating the resulting product.

3,911,009

PROCESS FOR THE PRODUCTION OF ACRYLAMIDE AND METHACRYLAMIDE

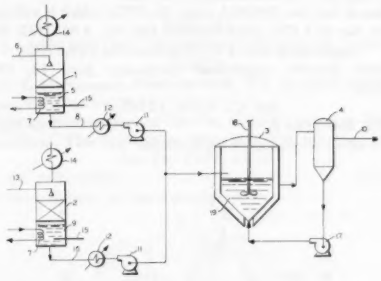
Kiyotaka Yoshimura, Fujisawa; Shiro Asano, and Tadatoshi Honda, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Dec. 6, 1971, Ser. No. 205,137

Claims priority, application Japan, Dec. 14, 1970, 45-110514

Int. Cl.[2] C07C *103/08*

U.S. Cl. 260—561 N **5 Claims**



1. In a process for preparing acrylamide or methacrylamide by reacting acrylonitrile or methacrylonitrile with water or a water donor in the presence of a metallic copper containing catalyst the improvement comprising adding to the reaction liquid a promoter for said catalyst, said promoter being selected from the group consisting of copper sulfate, copper nitrate, cupric chloride and a copper salt of a lower fatty acid, in an amount of from 10 to 150 ppm calculated as copper and based upon available water.

5. A continuous process for preparing acrylamide or methacrylamide which comprises reacting acrylonitrile or methacrylonitrile with water or a water donor at a temperature of about 50° – 300°C. in the presence of 0.01 to 100 g per mol of acrylonitrile or methacrylonitrile of a copper catalyst selected from the group consisting of Raney copper, Ullmann copper, reduced copper oxide, and copper containing (a) at least one metal selected from the group consisting of chromium and zinc or (b) a reduced oxide of said metal, and adding to the reaction liquid a promoter selected from the group consisting of copper sulfate, copper nitrate and cupric chloride in an amount of about 10 to 150 ppm calculated as copper and based upon available water.

3,911,010

AMINOPHENYLAMIDINES, THEIR PRODUCTION AND THEIR PHARMACEUTICAL USE

Hartmund Wollweber, Wuppertal-Elberfeld, Germany, and Winfried Flucke, Beenleigh, Australia, assignors to Bayer Aktiengesellschaft, Germany

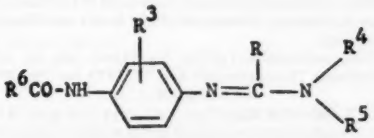
Division of Ser. No. 151,581, June 9, 1971, Pat. No. 3,818,070. This application Sept. 19, 1973, Ser. No. 398,692

Claims priority, application Germany, June 13, 1970, 2029298

Int. Cl.[2] C07B *103/10*

U.S. Cl. 260—562 H **6 Claims**

1. A compound selected from the group consisting of an aminophenylamidine and the physiologically acceptable acid addition salts thereof, said aminophenylamidine having the formula



wherein

R is alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms or cycloalkyl of 3 to 7 carbon atoms;

R^3 is hydrogen, chloro, fluoro, bromo, cyano, trifluoromethyl, nitro, alkyl of up to 4 carbon atoms, alkoxy of up to 4 carbon atoms and alkenyl of up to 4 carbon atoms; R^4 is an aliphatic substituent of up to 4 carbon atoms selected from the group consisting of alkyl, alkenyl, alkynyl and alkoxy;

R^5 is an alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms; and

R^6 is hydrogen or an aliphatic substituent of up to 6 carbon atoms selected from the group consisting of alkyl, alkenyl, alkynyl and alkoxyalkyl, said aliphatic substituent being unsubstituted or substituted by fluoro, chloro, bromo, hydroxy or cyano.

3,911,011

3,5-DINITROANILINE DERIVATIVES

Brian William Sharp, Hornchurch; Dennis Warburton, Brentwood; Raymond Barry Williams, Upminster, and Kenneth Robert Harry Wooldridge, Brentwood, all of England, assignors to May & Baker Limited, England

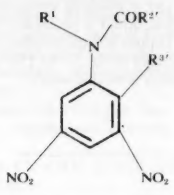
Filed Mar. 21, 1974, Ser. No. 453,643

Claims priority, application United Kingdom, Mar. 23, 1973, 14191/73

Int. Cl.[2] C07C *103/127*

U.S. Cl. 260—562 R **12 Claims**

1. A 3,5-dinitroaniline derivative of the formula:



wherein R^1 is hydrogen, methyl, ethyl, n-propyl, iso-propyl, n-butyl, iso-butyl or sec-butyl, R^2 is hydrogen, alkyl of 1 through 4 carbon atoms or cycloalkyl of 3 or 4 carbon atoms, and R^3 is hydrogen, methyl or ethyl, R^3 being methyl or ethyl when R^1 is hydrogen and R^2 is hydrogen, methyl or ethyl.

3,911,012

METHOD OF PREPARING 4-CHLORO-DERIVATIVES OF PHENYLFORMAMIDINE AND SALTS THEREOF

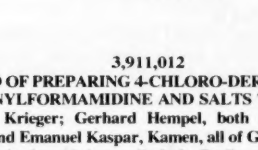
Bernhard Krieger; Gerhard Hempel, both of Bergkamen-Mitte, and Emanuel Kaspar, Kamen, all of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Continuation-in-part of Ser. No. 54,863, July 14, 1970, abandoned. This application Aug. 17, 1973, Ser. No. 389,235

Int. Cl.[2] C07C *123/00*

U.S. Cl. 260—564 RF **8 Claims**

1. A method for the preparation of 4-chloro- derivatives of a phenylformamidine of the formula



wherein R is hydrogen or lower alkyl, R_1 is hydrogen or lower alkyl, and R_2 is lower alkyl, which comprises chlorinating an acid addition salt of a n inorganic acid of said phenylformamidine with a chlorinating agent selected from the group con sisting of chlorine gas and a chlorine donor, at a temperature between about 0° and 50° C. in an acidic liquid medium.

3,911,013

NEW AMINOPHENYLAMIDINES, THEIR PRODUCTION AND THEIR MEDICINAL USE

Hartmund Wollweber, Wuppertal, Germany, and Winfried Flucke, Beenleigh, Australia, assignors to Bayer Aktiengesellschaft, Germany

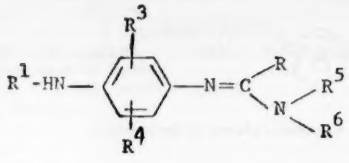
Division of Ser. No. 399,813, Sept. 24, 1973, which is a division of Ser. No. 151,575, June 9, 1971, Pat. No. 3,855,292. This application Oct. 17, 1974, Ser. No. 515,576

Claims priority, application Germany, June 13, 1970, 2029299

Int. Cl.[2] C07C *123/00*

U.S. Cl. 260—564 RF **8 Claims**

1. A compound of the formula:



wherein

R^1 is hydrogen, alkyl of 1 to 5 carbon atoms, alkoxyalkyl of 2 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms;

each of R^3 and R^4, independently of the other, is fluoro, chloro or bromo, or one is hydrogen and the other is fluoro, chloro or bromo;

R is alkyl of 1 to 5 carbon atoms;

R^5 is alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkynyl of 2to 4 carbon atoms, or cycloalkyl of 3 to 6 carbon atoms; and

R^6 is hydrogen, alkyl of 1 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms;

or a salt thereof of a pharmaceutically acceptable acid.

3,911,014

AMINOPHENYLAMIDINES, THEIR PRODUCTION AND THEIR MEDICINAL USE

Hartmund Wollweber, Wuppertal-Elberfeld, Germany, and Winfried Flucke, Beenleigh, Australia, assignors to Bayer Aktiengesellschaft, Germany

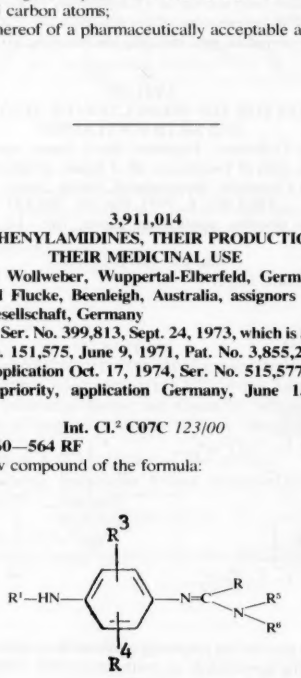
Division of Ser. No. 399,813, Sept. 24, 1973, which is a division of Ser. No. 151,575, June 9, 1971, Pat. No. 3,855,292. This application Oct. 17, 1974, Ser. No. 515,577

Claims priority, application Germany, June 13, 1970, 2029299

Int. Cl.[2] C07C *123/00*

U.S. Cl. 260—564 RF **3 Claims**

1. A new compound of the formula:



wherein

R^1 is hydrogen, alkyl of 1 to 5 carbon atoms, alkoxyalkyl of 2 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms;

each of R^3 and R^4 is trifluoromethyl, or one is hydrogen and the other is trifluoromethyl;

R is alkyl of 1 to 5 carbon atoms;

R^5 is alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkynyl of 2 to 4 carbon atoms, or cycloalkyl of 3 to 6 carbon atoms; and

R^6 is hydrogen, alkyl of 1 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms;

or a salt thereof of a pharmaceutically acceptable acid.

3,911,015
SUBSTITUTED ALKANOL-THIO-ALKYLAMINES AND SALTS THEREOF

Renato Andrisano, 8, via Toscanini, 40136 Bologna, Italy

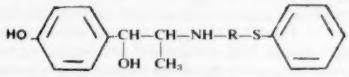
Continuation-in-part of Ser. No. 141,431, May 7, 1971, abandoned, and a continuation-in-part of Ser. No. 141,432, May 7, 1971, abandoned. This application Feb. 5, 1973, Ser. No. 329,563

Claims priority, application Italy, May 18, 1970, 3453/70; May 18, 1970, 3454/70

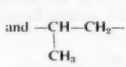
Int. Cl. C07c *93/06*

U.S. Cl. 260—570.5 S **5 Claims**

1. Substituted alkanol-thio-alkyl-amines having the formula:



wherein R represents a group selected from $—CH_2—CH_2—$, $—CH_2—CH_2—CH_2—$ and



and salts thereof.

3,911,016
N-FLUOROALKYLATED PHENYLETHYLAMINE

Karl Heinz Klingler, Langen, and Silke Habersang, Dornigheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed July 27, 1972, Ser. No. 275,453

Claims priority, application Germany, Aug. 28, 1971, 2143204

Int. Cl.² C07C *87/29*

U.S. Cl. 260—570.8 R **1 Claim**

1. A compound, which is (2-fluoroethyl)-[1-methyl-2-(o-methoxyphenyl-ethyl]-amine.

3,911,017
5-AMINOMETHYL-5H-DIBENZO[a,d]CYCLOHEPTENES

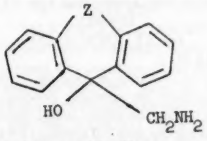
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 813,700, April 4, 1969, abandoned. This application Mar. 26, 1970, Ser. No. 23,077

Int. Cl.² C07C *87/29*

U.S. Cl. 260—570.9 **3 Claims**

1. A compound of the formula



in which Z is CH=CH or $—CH_2CH_2—$.

3,911,018
NOVEL PROCESS AND PRODUCTS PRODUCED BY SAID PROCESS

John B. Hall, Rumson, and James Milton Sanders, Eatontown, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 336,172, Feb. 27, 1973, abandoned. This application Jan. 21, 1974, Ser. No. 434,948

Int. Cl.² C07C *45/00*, *49/44*

U.S. Cl. 260—586 C **5 Claims**

1. The process for producing an amber-like fragrance composition containing a major proportion of 1′,2′,3′,4′,5′,6′,7′,8′-octahydro-2′,3′,8′,8′-tetramethyl acetonaphthone isomers comprising the steps of:

i. Admixing at a temperature of from about 0°C up to about 50°C myrcene and 3-methyl-3-pentene-2-one in the presence of a Lewis acid catalyst thereby forming a acetyl substituted cyclohexene mixture,

ii. Cyclizing the resulting acetyl substituted cyclohexene mixture with a cyclizing agent selected from the group consisting of concentrated phosphoric acid, sulfuric acid, boron trifluoride and complexes of boron trifluoride; and

iii. Obtaining a distillation fraction having a boiling point of 129–131°C at a pressure of about 2.6 – 2.9 mm Hg.

3,911,019
PREPARATION OF METHYLHEPTENONE

Niklaus Halder, Fullinsdorf, and Heinrich Frick, Riehen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 10, 1973, Ser. No. 387,404

Claims priority, application Switzerland, Aug. 14, 1972, 12007/72

Int. Cl.² C07C *45/02*

U.S. Cl. 260—597 R **7 Claims**

1. A process for obtaining methylheptenone, comprising heating a reaction mixture, which comprises 1 part by weight methyl vinyl ketone, about 4 to 40 parts by weight isobutylene, and from 0.1 to about 0.2 mole percent, based on methyl vinyl ketone, of a strong acid, having a dissociation constant of greater than 10^{-4} selected from the group consisting of sulfuric acid and a sulfonic acid, to a temperature of about 260°C. to 290°C. at a pressure at or above the vapor pressure of the reaction mixture.

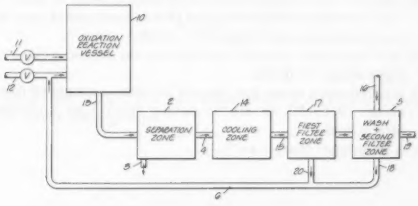
3,911,020
PROCESS FOR THE PREPARATION OF DIALKYLBENZENE DIHYDROPEROXIDE

William D. Cooper, Houston, Tex., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 844,956, July 25, 1969, abandoned, which is a continuation-in-part of Ser. No. 655,229, July 21, 1967, abandoned. This application Mar. 27, 1973, Ser. No. 345,340

Int. Cl.² C07C *179/02*

U.S. Cl. 260—610 B **4 Claims**



1. A method for preparing para-dialkylbenzene dihydroperoxide, comprising the steps:

a. oxidizing a dialkylbenzene selected from the group consisting of p-xylene, p-diethylbenzene, p-diisopropylbenzene and p-disecbutylbenzene in the presence of molecular oxygen and a small amount of an aqueous solution of an alkaline material selected from the group consisting of alkali and alkaline earth metal oxides, hydroxides, carbonates, and bicarbonates at a temperature between about 100° and 140°C to effect between about 25% and 55% conversion,

b. separating the effluent obtained from the reaction of step (a) into an aqueous phase and a non-aqueous phase,

c. cooling the non-aqueous phase to between about 15° and 45° to effect crystallization of a dihydroperoxide material including p-dialkylbenzene dihydroperoxide,
d. physically separating said cooled non-aqueous phase into solid dihydroperoxide material from the liquid non-aqueous fraction containing p-dialkylbenzene monohydroperoxide and unreacted p-dialkylbenzene,
e. displacement washing said solid dihydroperoxide material with an amount of p-dialkylbenzene approximately equal to the amount of the p-dialkylbenzene which was oxidized in step (a) plus the amount remaining with said solid dihydroperoxide,
f. separating said solid dihydroperoxide material from said wash liquid, and
g. recycling the recovered wash liquid of step (e) and the non-aqueous fraction from step (d) to the oxidation reaction of step (a).

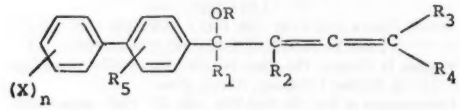
3,911,021

1-ALKOXY-1-ARYL-2,3-BUTADIENES

Eugene E. Galantay, Liestal, Switzerland, assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Jan. 14, 1974, Ser. No. 432,833
Int. Cl.[2] C07C *43/20*
U.S. Cl. 260—611 A **10 Claims**

1. A compound of the formula:



wherein
R is alkyl having form 1 to 3 carbon atoms;
R_1 is a hydrogen atom or alkyl of 1 to 3 carbon atoms;
R_2 is a hydrogen atom or methyl;
R_3 and R_4 are, independently, a hydrogen atom of alkyl of 1 to 3 carbon atoms, provided that at least one R_3 and R_4 is a hydrogen atom when R_2 is methyl;
R_5 is a hydrogen atom or halo having an atomic weight of from about 19 to 80;
X is a hydrogen atom, halo having an atomic weight of from about 19 to 80, or alkoxy having from 1 to 4 carbon atoms; and
n is an integer from 1 to 5.

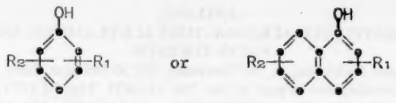
3,911,022

ETHERIFICATION OF PHENOLIC COMPOUNDS

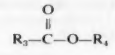
George T. McCloud; Marshall R. Brimer, and Charles L. Gibson, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 4, 1973, Ser. No. 367,038
Int. Cl.[2] C07C *43/20*
U.S. Cl. 260—612 D **5 Claims**

1. Process of preparing a phenolic ether comprising reacting a phenolic compound of the general formula



wherein R_1 and R_2 are each hydroxyl, hydrogen, or alkyl from C_1 to C_4, with from 1 to 3 parts by weight per part phenolic compound of a compound selected from the group consisting of alkanols having 1 to 4 carbon atoms, esters of the general formula



wherein R_3 and R_4 are each alkyl from C_1 to C_4, and mixtures of said alcohols and esters, in the presence of a catalytic quantity of a catalyst of the general formula

wherein R_5, R_6 and R_7 are each alkyl from C_1 to C_6, or a halide, sulfate or carboxylic acid salt of said catalyst wherein said carboxylic acid has from 1 to 4 carbon atoms, at a temperature of from about 200°C. to about 250°C. under a pressure of between 500 and 1500 psi.

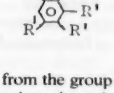
3,911,023

METHOD FOR REACTING ORGANIC HALIDES

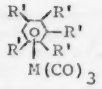
Michael F. Farona, Cuyahoga Falls, and James F. White, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

Division of Ser. No. 339,637, March 9, 1973, Pat. No. 3,832,403, which is a continuation of Ser. No. 119,908, March 1, 1971, abandoned. This application Apr. 11, 1974, Ser. No. 459,873
Int. Cl.[2] C07C *43/20*
U.S. Cl. 260—612 D **10 Claims**

1. The process of reacting an organic halide with an aromatic substrate to form an aromatic product comprising the steps of: charging a reaction vessel with a metallic hexacarbonyl compound having the general formula $M(CO)_6$ wherein M is selected from the group consisting of Cr, Mo and W, adding an aromatic substrate having the general formula



wherein R′ is selected from the group consisting of hydrogen and alkoxy having from 1 to about 4 carbon atoms, with the proviso that at least one of said R′ is alkoxy, reacting said metallic hexacarbonyl compound with part of said aromatic substrate to yield an arene metal tricarbonyl catalyst having the general formula



charging the reaction vessel with an organic halide having the general formula RX wherein R is selected from the group consisting of an alkyl group having from 1 to about 20 carbon atoms and an aryl group having from 7 to about 12 carbon atoms, and X is selected from the group consisting of bromine, chlorine and fluorine, heating said reaction vessel from ambient temperatures to a temperature sufficient to cause said catalyst to remove the halide from said organic halide with generation of a carbonium ion from said organic halide so that said carbonium ion will attack the remaining part of said aromatic substrate to yield the aromatic product.

3,911,024

FLUORINATED ISOPROPYL DERIVATIVES

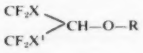
Louise S. Croix, 50 High St., Summit, N.J. 07901

Division of Ser. No. 600,011, Dec. 8, 1966. This application Mar. 18, 1971, Ser. No. 125,897

Int. Cl. C07c *43/00, 43/12, 41/04*

U.S. Cl. 260—614 F **4 Claims**

1. Alkyl halogenated isopropyl ethers having the formula



wherein R is an alkyl group having from 1 to 2 carbon atoms and X and X^1 are the same and are each a member of the group consisting of fluorine and chlorine.

3,911,025

ALKYNYL ALCOHOLS

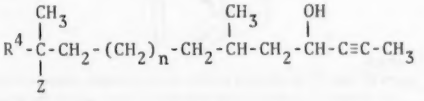
Clive A. Henrick, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 266,091, June 26, 1972, Pat. No. 3,801,611, which is a continuation-in-part of Ser. No. 187,897, Oct. 8, 1971, Pat. No. 3,755,411. This application Jan. 7, 1974, Ser. No. 431,522

Int. Cl.² C07C *43/00, 43/14*

U.S. Cl. 260—615 R **6 Claims**

1. A compound selected from those of the following formula:



wherein,

n is zero or one;

R^4 is methyl or ethyl; and

Z is lower alkoxy of one to three carbon atoms.

3,911,026

SYNTHESIS OF HYDROXYCYCLOPENTEN-1-ONES

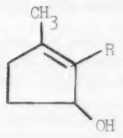
Richard Wightman Kierstead, and Ronald Andrew Lemahieu, both of North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 279,910, Aug. 11, 1972, Pat. No. 3,775,492, which is a division of Ser. No. 823,498, May 9, 1969, abandoned, which is a division of Ser. No. 706,657, Feb. 19, 1968, abandoned, which is a continuation-in-part of Ser. No. 649,441, June 26, 1967, abandoned. This application Aug. 20, 1973, Ser. No. 390,141

Int. Cl.² C07C *35/06*

U.S. Cl. 260—617 R **3 Claims**

1. A compound of the formula:



wherein R is alkenyl having from 3 to 7 carbon atoms.

3,911,027

BICYCLO[4,3,0]NONENOLS

Werner Skorianetz, Geneva, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

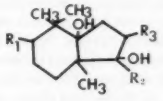
Filed Apr. 15, 1974, Ser. No. 460,838

Claims priority, application Switzerland, Apr. 16, 1973, 5492/73

Int. Cl.² C07C *35/22*

U.S. Cl. 260—617 F **2 Claims**

1. A compound of the formula



where R1, R2 and R3 each independently represent hydrogen or lower alkyl groups.

3,911,028

2-(4-HYDROXY-4-METHYLPENTYL)NORBORNADIENE AND PROCESS FOR PREPARING SAME

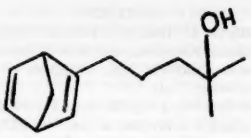
James Milton Sanders, Eatontown, and Manfred Hugo Vock, Locust, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 461,703, April 17, 1974, Pat. No. 3,886,289. This application Jan. 7, 1975, Ser. No. 539,093

Int. Cl.² C07C *35/30*

U.S. Cl. 260—617 F **1 Claim**

1. 2-(4-hydroxy-4-methylpentyl) norbornadiene having the structure:



3,911,029

HERBICIDAL BENZYL ALCOHOLS

Jerome M. Lavanish, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 264,683, June 20, 1972, abandoned. This application July 25, 1973, Ser. No. 382,630

Int. Cl.[2] C07C *33/04*

U.S. Cl. 260—618 R **3 Claims**

1. A composition of matter selected from the group consisting of 1-ethyl-2′,4′,6′-triisopropylbenzyl alcohol, 1-ethyl-2′,4′,5′-triisopropylbenzyl alcohol, and mixtures therof.

3,911,030

PROCESS FOR THE SEPARATION OF RESORCINOL AND HYDROQUINONE FROM THEIR ADMIXTURE

Hideaki Suda, Takaishi; Iwao Dohgane, Nishinomiya; Takashi Chinuki, Toyonaka; Kenji Tanimoto; Hirokazu Hosaka, both of Minoo; Kazunari Ebara, Takarazuka; Yukimichi Nakao, Kobe; Yuji Ueda, Izumiotsu; Seiya Imada, Sakai, and Minoru Yasuda, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed June 15, 1973, Ser. No. 370,362

Claims priority, application Japan, June 20, 1972, 47-62046

Int. Cl.[2] C07C *37/24*

U.S. Cl. 260—621 B **5 Claims**

1. A process for the separation of resorcinol and hydroquinone, which comprises forming a slurry by mixing a mixture consisting essentially of resorcinol and hydroquinone with at least one solvent selected from the group consisting of ethyl acetate, methyl benzoate, diethyl isophthalate, acrylonitrile, acrylic acid, methyl acrylate, anisole, methyl anisole, methyl alcohol, ethyl alcohol, tetrahydrofuran and dioxane, at a temperature of −20°C to 110°C, the amount of said solvent being one-tenth to 30 times by weight, based on said mixture of resorcinol and hydroquinone or said mixture in said solvent to form a solution by heating and then cooling to a temperature of −20°C to 110°C to form said slurry and separating the resulting slurry into crystals containing a predominant amount of hydroquinone and a solution containing a predominant amount of resorcinol.

3,911,031

PRODUCTION OF 3-NITRO-P-CRESOL-(1)

Helmut Hoch, and Hans-Juergen Quadbeck-Seeger, both of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 15, 1973, Ser. No. 341,348

Claims priority, application Germany, Mar. 21, 1972, 2213568; Dec. 22, 1972, 2262853; Dec. 22, 1972, 2262854

Int. Cl.[2] C07C *79/24*

U.S. Cl. 260—622 **14 Claims**

1. A process for the production of 3-nitro-p-cresol-(1) which comprises nitrating p-cresol carbonate with a nitrating agent selected from the group consisting of (a) concentrated nitric acid of 85–100% by weight concentration, and (b) a mixture of said nitric acid of said concentration and concentrated sulfuric acid of 98–100% by weight concentration in a ratio of 0.2 to 2 moles of nitric acid per mole of sulfuric acid at a temperature of 0°C to 40°C, precipitating the 3-nitro-p-cresol carbonate thus formed by dilution of the reaction mixture with 100 to 500% by weight of water, based on the total amount of said acid or acids used for said nitration (calculated as 100%), at a temperature of 85°–100°C, and hydrolyzing the 3-nitro-p-cresol carbonate in the presence of a 5–25% by weight aqueous ammonia solution at 65°–80°C and at a ratio of 4 to 8 moles of ammonia per mole of said 3-nitro-p-cresol carbonate.

3,911,032

PROCESS FOR PREPARING 2-BUTENE-1,4-DIOL FROM DICHLOROBUTENES

Toshio Sakomura; Hisashi Kisaki; Shunsuke Mabuchi; Yukihiro Tsutsumi, and Takashi Tada, all of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Continuation of Ser. No. 834,906, June 19, 1969, abandoned. This application Nov. 1, 1972, Ser. No. 302,910

Claims priority, application Japan, June 24, 1968, 43-43749; July 2, 1968, 43-45568

Int. Cl.[2] C07C *29/00*

U.S. Cl. 260—636 **12 Claims**

1. A process for preparing 2-butene-1,4-diol from 1,4-dichloro-2-butene or a mixture of dichlorobutenes rich in 1,4-dichloro-2-butene by a hydrolysis reaction comprising hydrolyzing 1,4-dichloro-2-butene in a reaction charge of (1) said 1,4-dichloro-2-butene, (2) water and (3) a water soluble formate of a metal selected from the group consisting of metals of Ia and group IIa of the periodic table at a temperature of from 70°C. to 150°C., the concentration of the aqueous solution of said formate being from about 3 to about 80 percent by weight and the equivalent ratio of said formate to said dichlorobutene being within a range from about 3:1 to about 0.8:1.

3,911,033

PRODUCTION OF 3,6-DIHALODIPHENYLALKANES

Ernst Schaffner, Ludwigshafen; Heinz Eilingsfeld, Frankenthal, and Manfred Patsch, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

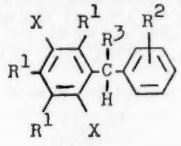
Filed Nov. 15, 1973, Ser. No. 416,258

Claims priority, application Germany, Nov. 18, 1972, 2256661

Int. Cl.[2] C07C *25/18*

U.S. Cl. 260—649 R **11 Claims**

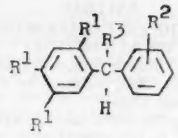
1. A process for the production of 3,6dihalodiphenylalkanes of the formula:



in which:

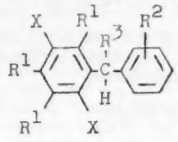
each R^1 and R^3 is alkyl of one to seven carbon atoms or said alkyl bearing substituents which are inert under the reaction conditions of the process; each R^2 and X is chlorine, bromine or iodine; with the proviso that R^2 and R^3 may also be hydrogen, which process comprises:

reacting a diphenylalkane of the formula



with molecular halogen of the formula X_2, R^1, R^2, R^3 and X having the above meanings.

2. A 3,6-dihalodiphenylalkane of the formula



wherein:

each R^1 and R^3 is alkyl of one to seven carbon atoms or said alkyl substituted by alkoxy of 1 to 3 carbon atoms, carbalkoxy of 2 to 4 carbon atoms, chloro, bromo, hydroxy, cyano or nitro; each R^2 and X is chlorine, bromine or iodine; with the proviso that R^2 and R^3 may also be hydrogen.

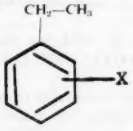
3,911,034

OXIDATIVE DEHYDROGENATION PROCESS OF AROMATIC COMPOUNDS

Haruhito Sato; Nobuaki Shimizu; Kosaku Honna, and Konomu Kurisawa, all of Chiba, Japan, assignors to Idemitsu Kosan Co. Ltd., Japan

Filed Jan. 4, 1974, Ser. No. 430,879
Claims priority, application Japan, Jan. 22, 1973, 48-9330
Int. Cl.[2] C07C *5/48, 25/28*
U.S. Cl. 260—650 R **4 Claims**

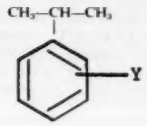
1. Process for oxidative dehydrogenation of aromatic compounds, comprising oxidative dehydrogenating a compound selected from the group consisting of (1) nuclear substituted ethyl benzene having the formula:



(I)

(wherein X represents a lower alkyl radical or a halogen atom)

and (2) cumene or a nuclear substituted cumene having the formula:



(II)

(wherein Y represents a hydrogen atom, a lower alkyl radical or a halogen atom),

said dehydrogenating being carried out at a temperature of from about 350° to 550°C in the presence of an oxidizing agent selected from the group consisting of oxygen, air and a mixture of gas containing oxygen or air and nitrogen or water and a phosphorus-tin-aluminum oxide catalyst composition comprising from about 10 to about 40 weight percent phosphorus calculated on the basis of P_2O_5, from about 10 to about 40 weight percent of tin calculated on the basis of SnO_2 and from about 40 to about 60 weight percent of aluminum calculated as Al_2O_3, said catalyst composition being prepared by mixing alumina sol or aluminum hydroxide, tin hydroxide and phosphoric acid at a predetermined ratio so that elementary phosphorus-tin-aluminum composition of catalyst finally obtained is within the aforementioned weight percents; and then calcining the resultant mixture; the ratio of the amount of catalyst composition to the amount of reactant supplied per hour in said process being from about 1.0 to 15.0 $g.mol^{-1}.hr.$ and the partial pressure ratio of reactant aromatic compound to oxidizing agent being from about 1/0.2 to 1/1.5.

3,911,035

NOVEL HEXAFLUOROHEXENES

William Alfred LaLande, Jr., Philadelphia; Murray Hauptschein, Glenside, and Robert Bonner Hager, Collegeville, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 146,503, May 24, 1971, abandoned. This application Nov. 14, 1973, Ser. No. 415,580
Int. Cl. C07c *17/26, 21/18*
U.S. Cl. 260—653.1 R **7 Claims**

3. The method of preparing 4,4,5,6,6,6-hexafluorohexene-1 and 4,4,5,6,6,6-hexafluorohexene-2 which comprises reacting hexafluoropropylene and propylene in a mole ratio within the range of about 1:1 to 1:20 at elevated temperatures of from about 200°C to about 800°C and pressures ranging from one to about 500 atmospheres, and separating said hexafluorohexenes from the 1-trifluoromethyl-1,2,2-trifluoro-4-methylcyclobutane coproduct also produced by said reaction.

3,911,036

METHOD OF PRODUCING DICHLOROETHANE

Lucio Di Fiore, and Benedetto Calcagno, both of Milan, Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed July 31, 1972, Ser. No. 276,613
Claims priority, application Italy, Nov. 17, 1971, 31198/71
Int. Cl.[2] C07C *17/02*
U.S. Cl. 260—660 **3 Claims**

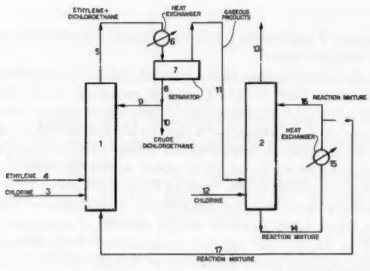
1. Process for the production of dichloroethane by the reaction of ethylene with chlorine, characterized in that:

in a first stage of reaction, gaseous ethylene and chlorine are fed into a boiling liquid reaction medium consisting essentially of dichloroethane and containing ferric chloride or cupric chloride without application of an external overpressure, the quantity of chlorine supplied to this stage being such as will bring about conversion of 17 percent of the ethylene supplied;

the gases emerging from this stage are cooled so as to separate the dichloroethane from the unaltered ethylene;

the said dichloroethane is recovered and subjected to rectification;

the unreacted ethylene is supplied to a second reaction stage containing a liquid reaction medium maintained at temperatures from 0° to 40°C, consisting essentially of dichloroethane and containing a chlorination catalyst, the quantity of chlorine supplied to this stage being such as will bring about substantially complete conversion of the



ethylene to dichloroethane, the temperature in the second reaction stage being maintained by passing the product of reaction from the second stage through a heat exchanger and the recycling a portion of said product to said second stage;

the product of reaction from the second stage is recycled to the first stage of reaction.

3,911,037

CONTINUOUS GRIGNARD REACTORS

Guy E. Blackmar, Freeport; Robert C. Wight, Sugarland, and Richard B. Smith, Freeport, all of Tex., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Nov. 21, 1973, Ser. No. 418,101
Int. Cl.[2] C07F *3/02*
U.S. Cl. 260—665 G **9 Claims**

1. A method for continuous production of Grignard reagent comprising: constantly introducing into a reaction vessel an organohalide and solvent under pressure while concurrently adding to said vessel magnesium for Grignard reaction, constantly feeding a portion of overflow product from the reaction vessel to a surge product holding vessel, constantly withdrawing and feeding another portion of overflow product to a heat exchanger while constantly returning that same portion to the reaction vessel, introduction of the solvent and organohalide being accomplished at least in part by introducing the same to the product being delivered to the heat exchanger, and delivering the contents of the holding vessel for storage or use.

3,911,038

PROCESS FOR MAKING BIS(PHENYLETHYLNYL) ANTHRACENES

Donald Roy Maulding, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 25, 1974, Ser. No. 454,352
Int. Cl.[2] C07C *15/28*
U.S. Cl. 260—668 F **11 Claims**

1. A method of preparing bis(phenylethynyl)anthracenes comprising (1) reacting a quinone with the lithium salt of phenylacetylene at moderately elevated temperatures in a solvent mixture of dioxane and an amide cosolvent to obtain the corresponding dihydro-dihydroxybis(phenylethynyl)anthracene, (2) reducing the latter compound in situ to the corresponding bis(phenylethynyl)anthracene, (3) acidifying the reaction mixture with a suitable base-binding agent or mixture of base-binding agents to precipitate the latter compound, and (4) recovering said bis(phenylethynyl)anthracene therefrom.

3,911,039

PROCESS FOR THE PREPARATION OF BUTADIENE FROM N-BUTENE

Robert K. Grasselli, Chagrin Falls, and Harley F. Hardman, Lyndhurst, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 23, 1974, Ser. No. 435,841
Int. Cl. C07c *5/18*
U.S. Cl. 260—680 E **3 Claims**

1. In the process for the oxidative dehydrogenation of n-butene to butadiene comprising contacting a mixture of the n-butene and molecular oxygen with a catalyst at a temperature of about 200° to about 600°C., the improvement comprising

using as the catalyst a catalyst wherein the atomic ratios are described by the empirical formula

$$Sb_a\ C_c\ D_d\ Fe_e\ Bi_f\ Mo_{12}\ O_x$$

wherein

C is an alkali metal, Tl or mixture thereof; and

D is nickel; cobalt, magnesium, zinc, cadmium, manganese, calcium or mixture thereof;

and wherein

a and *c* are 0.01 to about 4;

d is 0.1 to about 20;

e and *f* are 0.1 to 12; and

x is the number of oxygens required by the valence states of the other elements present.

3,911,040

SEPARATION PROCESS

James Reid Shelton, East Cleveland, Ohio, and Dale C. Perry, Minneapolis, Minn., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 10, 1974, Ser. No. 478,120
Int. Cl. C07c *7/02*
U.S. Cl. 260—681.5 R **3 Claims**

1. A method of selectively removing 1,3-cyclopentadiene from a hydrocarbon mixture containing 1,3-cyclopentadiene and other hydrocarbons, which comprises the steps of intimately contacting said hydrocarbon mixture containing 1,3-cyclopentadiene with a polyester compound containing a maleate unit, to form an adduct of 1,3-cyclopentadiene and the polyester compound containing a maleate unit, and subsequently separating the remaining hydrocarbons from the adduct.

3,911,041

CONVERSION OF METHANOL AND DIMETHYL ETHER

Warren W. Kaeding, Westfield, and Stephen A. Butter, East Windsor, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,307
Int. Cl.[2] C07C *1/20*
U.S. Cl. 260—682 **20 Claims**

1. A process for the conversion of methanol or dimethyl ether comprising contacting said methanol or dimethyl ether at a temperature of at least about 300° C with a catalyst comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12, a constraint index of about 1 to 12, and containing phosphorus incorporated with the crystal structure thereof in an amount of at least about 0.78 percent by weight.

3,911,042
METHOD OF PRODUCING BUTENE-1

Gennady Petrovich Belov, Noginsky raion, p/o Chernogolovka, ulitsa Pervaya, 5, kv. 15; Taimuraz Savelievich Dzhabiev, Noginsky raion, p/o Chernogolovka, ulitsa Pervaya, 31, kv. 41; Fridrikh Stepanovich Dyachkovsky, Noginsky raion, p/o Chernogolovka, ulitsa Tretya, 3, kv. 2; Vyacheslav Ivanovich Smirnov, Noginsky raion, p/o Chernogolovka, ulitsa Tretya, 1, kv. 19; Nelli Dzhavkharovna Karpova, Noginsky raion, p/o Chernogolovka, ulitsa Pervaya, 29, kv. 100; Khaim-Mordkhe Aronovich Brikenshtein, Noginsky raion, p/o Chernogolovka, ulitsa Vtoraya, 5, kv. 1; Matrena Petrovna Gerasina, Noginsky raion, p/o Chernogolovka, ulitsa Pervaya, 2a, kv. 61, all of Moskovskaya oblast; Vladimir Evgenievich Kuzmin, ulitsa 50 letiya Oktyabrya, 13/12, kv. 199, Kazan; Petr Evgenievich Matkovsky, Noginsky raion, p/o Chernogolovka, ulitsa Pervaya, 16, kv. 26, Moskovskaya oblast; Ljudmila Nikolaevna Russiyan, Noginsky raion, p/o Chernogalovka, ulitsa Pervaya, 2a, kv. 41, Moskovskaya oblast; Anatoly Dmitrievich Pomogailc, Noginsky raion, p/o Chernogolovka, ulitsa Pervaya, 33, kv. 15, Moskovskaya oblast, all of U.S.S.R.; Nikolai Mikhailovich Chirkov, deceased, late of Moscow, U.S.S.R., and by Mikhail Nikolaevich Chirkov, administrator, ulitsa Vavilova, 55/5, kv. 6, Moscow, U.S.S.R.

Division of Ser. No. 436,809, Jan. 25, 1974. This application Aug. 5, 1974, Ser. No. 494,917

Int. Cl.[2] C07C *3/10*

U.S. Cl. 260—683.15 D **1 Claim**

1. A method of producing butene-1, residing in that ethylene is dimerized to butene-1 in the presence of a complex organometallic catalyst consisting of titanium alcoholates of the formula $Ti(OR)_4$ and alkylaluminium of the formula $AlR_2''R'$, where R is an alkyl radical with the number of carbon atoms from 2 to 4, R'=R or H and R'' is the same as R, in the medium of a solvent selected from the group consisting of ethyl chloride, diethyl ether, vinylbutyl ether, methylphenyl ether, diphenyl ether, tetrahydrofuran, a mixture of diethyl ether with butene-1 and a mixture of diethyl ether with ethyl chloride.

RDK DAM

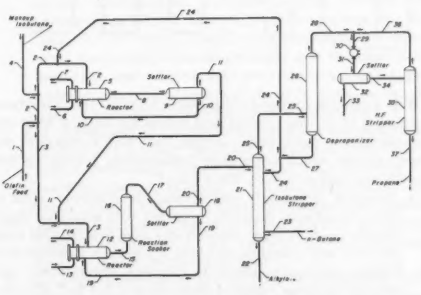
3,911,043
PLURAL STAGES OF HF ALKYLATION OF ISOPARAFFIN WITH A MONO-OLEFIN

Robert F. Anderson, LaGrange Park, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 291,137, Sept. 21, 1972, Pat. No. 3,830,865, which is a continuation-in-part of Ser. No. 236,049, March 20, 1972, Pat. No. 3,787,518. This application Mar. 27, 1974, Ser. No. 455,178The portion of the term of this patent subsequent to Nov. 5, 1991, has been disclaimed.

Int. Cl.[2] C07C *3/54*

U.S. Cl. 260—683.45 **4 Claims**



1. A process for alkylating an isoparaffin with a mono-olefin of from 3 to 5 carbon atoms per molecule, which comprises the steps of:

a. contacting said isoparaffin with a first portion of said mono-olefin in admixture with a first hydrogen fluoride catalyst in a first alkylation zone at alkylation conditions;

b. separating the resultant reaction mixture into a catalyst phase and a hydrocarbon phase containing isoparaffin-olefin alkylate and unreacted isoparaffin, and recycling separated catalyst phase to said first zone;

c. admixing a second portion of said mono-olefin with said hydrocarbon phase from step (b) containing alkylate and unreacted isoparaffin and subjecting the resultant mixture to alkylation conditions in contact with a second hydrogen fluoride catalyst in a second alkylation zone;

d. separating the effluent of said second zone into a second hydrocarbon phase and a second catalyst phase and recycling said second catalyst phase to said second zone;

e. fractionating said second hydrocarbon phase to separate therefrom a lower boiling isoparaffin fraction and a higher boiling alkylate product; and

f. recycling said isoparaffin fraction to said first zone and recovering said alkylate product.

RDK DAM

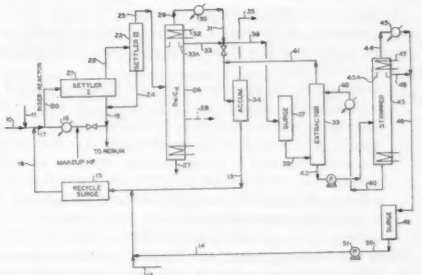
3,911,044
REMOVAL OF PROPANE FROM ALKYLATION EFFLUENT WITHOUT LOSS OF ETHYL FLUORIDE

Cecil O. Carter, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 19, 1973, Ser. No. 408,155

Int. Cl.[2] C07C *3/54*

U.S. Cl. 260—683.48 **3 Claims**



1. A process for the alkylation of isoparaffin with an olefin in which ethyl fluoride and propane are present in the hydrocarbon phase which comprises: (1) fractionating said hydrocarbon phase, thereby obtaining a stream consisting essentially of isoparaffin, propane, and ethyl fluoride; (2) extracting said stream with HF acid thereby removing ethyl fluoride from said stream; (3) passing said stream from which ethyl fluoride was removed to a separating zone to separate propane vapor from said stream; (4) separating propane from the separating zone; and (5) recycling isoparaffin from said separating zone and separated ethyl fluoride from step (2) to the alkylation zone.

3,911,045

PROCESS FOR THE PRODUCTION OF SHAPED STRUCTURES RESISTANT TO HIGH TEMPERATURES

Peter Hartmann; Ernst Roos, both of Cologne; Erich Esch, Leverkusen; Hermann Fries, Schildgen, and Günter Hentze, Odenthal-Hahnenberg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 11, 1974, Ser. No. 440,977

Claims priority, application Germany, Feb. 9, 1973, 2306463

Int. Cl.[2] C08L *61/04, 83/06*

U.S. Cl. 260—826 **10 Claims**

1. A process for producing a shaped structure which is resistant to high temperature which comprises mixing (a) phenol-formaldehyde resin, cresol-formaldehyde resin or a mixture thereof with (b) a polysiloxane resin consisting of 70 to 98 molar % of $RSiO_{3/2}$ units, 2 to 20 molar % of $R_2SiO_{2/2}$ units, 0 to 10 molar % $C_6H_5SiO_{3/2}$ units and 0 to 5 molar % $R_3SiO_{1/2}$ units wherein R is a hydrocarbon chain having one to four carbon atoms and curing said mixture by heating it at an elevated temperature to thereby form said shaped structure, the resin of (a) being formed by reacting phenol, cresol or a mixture thereof with aqueous formaldehyde in a molar ratio of 1:0.6 to 1:1.4 and there being from 10 to 70% by weight of (a) based on the weight of (a) plus (b).

3,911,046

PROCESS FOR THE RECOVERY OF FORMALDEHYDE AND PHENOL

Jacob Ackermann, Gorla Minore (Varese); Pierino Radici, Turate (Como), and Pietro Erini, Olgiate Olona (Como), all of Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 21, 1972, Ser. No. 317,491

Claims priority, application Italy, Dec. 27, 1971, 32951/71

Int. Cl.[2] C08G *14/08;* **C08L** *61/24*

U.S. Cl. 260—840 **9 Claims**

1. Process for the simultaneous recovery in the form of a useful product, of formaldehyde and phenol contained in the relative waste waters, and for the purification of the said waste waters, comprising:

a. mixing a waste aqueous solution containing phenol in a concentration of 0.01 to 5.0% by weight with a waste aqueous solution containing formaldehyde in a concentration of 0.5 to 10% by weight and, in a first stage of reaction, forming a resol phenolic resin at a working temperature of from 60° to 120°C over a period of 1 to 8 hours, the pH of the reaction medium being higher than 7 up to approximately 12;

b. adding to the aqueous solution of phenolic resin obtained in the first stage urea and possibly a further quantity of the waste aqueous solution containing formaldehyde and, in a second stage of reaction, forming a mixed phenol formaldehyde urea resin at a working temperature of from 60° to 120°C for a period of 1 to 4 hours; and

c. distilling the water from the aqueous solution containing the mixed resin, obtained in the second stage of the reaction, the working pressure being below atmospheric pressure.

3,911,047

SHAPED STRUCTURES MADE OF ACRYLONITRILE POLYMERS WITH ANTISTATIC ADDITIVES

Gerhard Dieter Wolf, Dormagen; Francis Bentz, Cologne, and Gunther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Oct. 18, 1974, Ser. No. 516,132

Claims priority, application Germany, Oct. 24, 1973, 2353213

Int. Cl.[2] C08G *41/04*

U.S. Cl. 260—859 R **4 Claims**

1. A shaped structure of an acrylonitrile polymer containing at least 60% by wieght acrylonitrile and containing as an antistatic additive from 0.5 to 15 %, by weight, based on the total mixture, of at least one polyether polyurethane compound of the general formula

$$R—NHCO—(OCH_2CH_2)_n—A—(CH_2CH_2O)_n—[COHN—R'—NHCO—(OCH_2—CH_2)_n—A—(CH_2CH_2O)_n]_p—OCN—H—R$$

in which

A denotes a bivalent radical of an aromatic biphenol of the formula

$$—O—R''—O—$$

in which

R'' denotes a bivalent aromatic radical consisting of one or more condensed aromatic rings or of aromatic rings which are joined together by a single bond or by a bridge member selected from the group consisting of —O—, —S—, $—SO_2—$, $—CH_2—$, $—CHCH_3—$, $—C(CH_3)_2—$and

or

it denotes a bivalent five-, six- or seven-membered heterocyclic radical which contains at least two nitrogen atoms and which is linked in the polyether chain by two nitrogen atoms:

R denotes a C_1-C_{18} alkyl, cycloalkyl, aralkyl or alkaryl radical, any of which radical may be substituted by halogen or alkyl;

R' denotes an alkylene, cycloalkylene, arylene, aralkylene or alkarylene radical, any of which radicals may be substituted by halogen or alkyl;

n denotes an integer of from 5 to 50; and

p denotes O or an integer of from 1 to 10.

3,911,048

PROCESS FOR THE CONTINUOUS PREPARATION OF UNSATURATED POLYESTERS

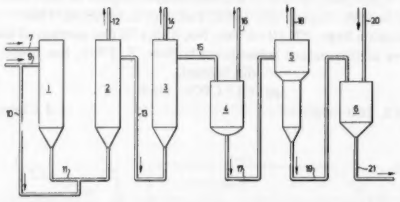
Silvio Vargiu, Sesto S. Giovanni (Milan); Beppino Passalenti, and Ugo Nistri, both of Milan, all of Italy, assignors to Societa' Italiani Resine S.I.R. S.p.A., Milan, Italy

Filed Nov. 29, 1973, Ser. No. 420,348

Claims priority, application Italy, Nov. 30, 1972, 32278/72

Int. Cl.[2] C08G *63/22, 65/52*

U.S. Cl. 260—861 **10 Claims**



8. In a process for producing unsaturated polyester mixtures consisting of mixing unsaturated polyesters with at least one polymerizable monomeric acrylic or vinyl compound the improvement which comprises continuously producing said unsaturated polyesters by the steps of:

a. bringing olefinically unsaturated dicarboxylic acids or their anhydrides, if desired together with saturated dicarboxylic acids or their anhydrides (dicarboxylic acid component) and dihydric alcohols, if desired together with higher polyhydric alcohols (alcohol component) into contact in molar ratios of from about 1.5:1 to 1.95:1 in a first reaction phase, operating at a temperature of from about 100° to 160°C and with residence times of from

about 5 to 40 minutes to cause the formation of a corresponding half-ester;

b. adding to the half-ester formed a further quantity of the alcohol component in such a way as to give a molar ratio of the dicarboxylic acid component to the total amount of the alcohol component is the range of from about 0.87:1 to 0.97:1;

c. bringing about the polyesterification in a second reaction phase by the treating the product obtained in b) in at least two separate and successive stages, which are operated at decreasing pressure values in the range of from about 5 atmospheres to atmospheric pressure, for a total time of from about 2 to 8 hours, and at temperatures of from about 100° to 220°C, the temperature between said stages not differing by more than about 10°C, the water formed during the polyesterification being eliminated from each of the said stages;

d. evaporating the residual water and the excess of the alcohol component from the polyesterification product obtained in c) with operation at pressures below atmospheric pressure.

3,911,049

PREPARATION OF B-STAGE UNSATURATED POLYESTER RESINS

John J. Kracklauer, Boulder, Colo., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 6, 1972, Ser. No. 232,264
Int. Cl.[2] C08L *67/06*
U.S. Cl. 260—863 **7 Claims**

1. A method of preparing a stable B-stage thermosetting polyester resin which comprises the steps of:

a. Admixing a composition comprising

1. an unsaturated carboxylic polyester resin, comprising a polycondensation product of a dicarboxylic acid or anhydride with a polyhydric alcohol admixed with an ethylenically unsaturated monomer capable of copolymerizing said unsaturated carboxylic polyester;
2. a dicyclopentadienyl iron compound selected from the group consisting of ferrocene, ethylferrocene, diethylferrocene, N-butylferrocene, di-n-butylferrocene, acetylferrocene, butyrylferrocene, benzoylferrocene;
3. a peroxide compound selected from the group consisting of dibenzoyl peroxide, di-(4-chlorobenzoyl) peroxide, di-(2,4-dichlorobenzoyl) peroxide, dilauroyl peroxide, t-butylperoxy 2-ethylhexanoate, t-butylperoxy isobutyrate, 2,5-dimethyl-2,5-di(benzoylperoxy)-hexane, 2,5-dimethyl-2,5-di(2-ethylhexanoylperoxy)-hexane, methylethyl ketone peroxide and cyclohexanone peroxide, and wherein said peroxide compound is provided in amounts of less than about 20 parts, by wt., per part of said dicyclopentadiene iron compound;
4. a thermosetting catalyst selected from the group consisting of di-t-butylperoxide, n-butyl-4,4-bis(t-butylperoxy)valerate, dicumylperoxide, 2,5-dimethyl-2,5-bis(t-butylperoxy)hexane, 2,2'-azobis(isobutyronitrile), and 2,2-bis(t-butylperoxy)butane and wherein said thermosetting catalyst is provided in a quantity ranging about from 0.5 to 1 percent, by wt., of the total weight of said composition and

b. Aging the composition of step a) at temperatures in the range of about from 10° to 150°C for about from 5 minutes to 3 days to effect B-stage cure of said composition.

3,911,050

FIRE RETARDANT POLYESTERS

Victor F. G. Cooke, Youngstown, and James A. Duquin, Tonawanda, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed May 23, 1973, Ser. No. 363,236
Int. Cl.[2] C08G *63/52*; **C08L** *67/06*
U.S. Cl. 260—869 **19 Claims**

1. An ethylenically unsaturated polyester having an average molecular weight of at least about 1100 and containing at least an average of two reactive double bonds per molecular chain, said polyester being obtained by reacting an acid component comprising a polyhalodicarboxylic acid or anhydride and an α, β-ethylenically unsaturated dicarboxylic acid or anhydride with a polyol component comprising from about 1 to about 2 equivalent proportions of a polyol of functionality greater than two, from 0 to about 1 equivalent proportion of a dihydric alcohol and from about 0.8 to about 1.2 equivalent proportion of a monofunctional haloalcohol of the formula

$C_nH_{2n+1-z}Y_zOH$

wherein n is 2 to 6, z is 2 to 7 and Y is halogen of the group consisting of fluorine, chlorine and bromine.

3,911,051

CROSS-LINKED ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE AND S-B COPOLYMER COMPOSITION AND PROCESS FOR MOLDING

James J. Schouten, Glenn Ellyn, and Robert V. Wargin, Darien, both of Ill., assignors to The Richardson Company, Des Plaines, Ill.

Filed Apr. 25, 1974, Ser. No. 464,049
Int. Cl. C08f *41/12*
U.S. Cl. 260—876 B **19 Claims**

1. A curable composition comprising a blend of:

A. from about 50 to about 99 parts by weight of a polyethylene polymer having a molecular weight of greater than about 1.5 million;

B. from about 1 to about 50 parts by weight of a cross-linking hydrocarbon binder comprising copolymers of butadiene and vinyl aromatics said butadiene having at least 50 percent 1, 2, vinyl unsaturated units; and

C. from about 0.1 to about 5 parts by weight of a free radical initiating cross-linking catalyst.

3,911,052

BLOCK COPOLYMERS OF ETHYLENE AND PROPYLENE AND PROCESS FOR THEIR MANUFACTURE

Eugene G. Castagna, Clark; Peter J. Perron, Pompton Plains, both of N.J., and Ronald I. Christensen, Odessa, Tex., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Mar. 12, 1973, Ser. No. 340,405
Int. Cl. C08f *15/04*
U.S. Cl. 260—878 B **7 Claims**

1. A process for preparing an ethylene-propylene block composition comprising:

1. copolymerizing ethylene and propylene in the presence of hydrogen and a catalytic amount of a catalyst formed by admixing a subhalide of a metal selected from the metals of Groups IVa, Va and VIa of the Periodic Table according to Mendeleef and aluminum compound containing at least one carbon to metal bond and in a slurry to a solids content of 5 to 60% by weight to form a random copolymer preblock comprising 1 to 10% on a molar basis of ethylene derived units and which has an average molecular weight of from 50,000 to 500,000 and exhibits a crystalline structure under X-rays;
2. removing any volatiles present with said preblock to a level of no more than 5% by weight;
3. transferring said preblock while it still contains active catalyst to a continuously agitated reaction zone;

4. introducing ethylene and propylene to said reaction zone; and
5. block polymerizing said ethylene and propylene of step (4) onto said preblock in the vapor phase to form a random copolymer postblock comprising 1 to 30% on a molar basis of ethylene derived units, said post block having an average molecular weight of from 20,000 to 2,000,000 and exhibiting crystalline structure under X-rays and constituting 4 to 40% by weight of the total ethylene-propylene block copolymer composition.

3,911,053
GRAFT COPOLYMER PRESSURE-SENSITIVE ADHESIVES

Hubert Wiest; Alois Stoll, and Hans-Herbert Nunner, all of Burghausen, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany

Filed Oct. 26, 1973, Ser. No. 409,912

Claims priority, application Germany, Oct. 30, 1972, 2253245

Int. Cl.² C08L *23/08*; **C08F** *255/02*

U.S. Cl. 260—878 R **5 Claims**

1. Graft copolymers for use as polymeric pressure-sensitive adhesives consisting of (I) from 5 to 35% by weight of a graft base soluble in the monomer component selected from the group consisting of (i) a copolymer of 40 to 75% by weight of said copolymer of ethylene, 25 to 60% by weight of said copolymer of vinyl acetate and 0 to 10% by weight of said copolymer of monomers copolymerizable with ethylene and vinyl acetate, (ii) said copolymer with up to 10% by weight of said copolymer of vinyl alcohol units derived from vinyl acetate units, (iii) mixtures of 25 to 99.9% by weight of said copolymer with from 0.1 to 75% by weight of other graftable polymers soluble in the monomer component, and (II) from 65 to 95% by weight of a monomer mixture grafted to said graft base consisting of (*a*) from 5 to 60% by weight of said mixture of vinyl esters of alkanoic acids having 2 to 4 carbon atoms, (*b*) from 40 to 95% by weight of said mixture of monomers selected from the group consisting of vinyl esters of alkanoic acids having 6 to 18 carbon atoms, esters of α,β-alkenoic acids having 3 to 8 carbon atoms with alkanols having 3 to 18 carbon atoms, esters of alkenedioic acids having 4 to 8 carbon atoms with alkanols having 3 to 18 carbon atoms, and mixtures thereof, and (*c*) from 0 to 20% by weight of other olefinically-unsaturated compounds copolymerizable with said components (*a*) and (*b*).

3,911,054
PROCESS FOR LOWERING THE VISCOSITY OF A SOLUTION OF A LIVING POLYMER

Bernard C. Roest, Geleen, and Emanuel M. J. Pijpers, Elsloo, both of Netherlands, assignors to Stamicarbon N.V., Geleen, Netherlands

Filed Sept. 28, 1972, Ser. No. 293,055

Claims priority, application Netherlands, Oct. 1, 1971, 7113482

Int. Cl.² C08L *9/00*, *47/00*

U.S. Cl. 260—880 B **6 Claims**

1. A process for lowering the viscosity of a solution of a living polymer produced by polymerizing at least one conjugated diene monomer of 4–18 carbon atoms and then copolymerizing said diene with an anionically polymerizable monomer selected from the group consisting of methyl methacrylate, acrylonitrile, styrene, α-methylstyrene and mixtures thereof; which comprises reacting at least one conjugated diene monomer at a temperature of about +40° to +80° C in an organic solvent in the presence of 0.05 to 10 mmole of a lithium-containing polyfunctional anionic initiator per liter of the solvent for said diene monomer, and thereafter, after at least 50 weight percent of said diene monomer has been polymerized, consisting of adding in the latest stage of the polymerization process the Lewis base N,N,N′,N′-tetramethyl-1,2-diaminoethane(TMEDA) in the amount of from about 0.01 to 100 times the amount of said polyfunctional anionic initiator thereby forming a chelate with the lithium polyfunctional anionic initiator.

3,911,055
O-ALKYL-O-(1-CYANO-1-TERT.-BUTYLKETONOXIME)-HIONOPHOSPHORIC (PHOSPHONIC) ACID ESTERS

Walter Lorenz, Wuppertal; Manfred Jautelat, Burscheid-Hilgen; Wolfgang Behrenz; Ingeborg Hammann, both of Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

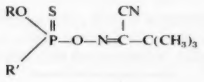
Filed Sept. 4, 1973, Ser. No. 394,027

Claims priority, application Germany, Sept. 2, 1972, 2243370

Int. Cl. A01n *9/36*; **C07f** *9/16*, *9/40*

U.S. Cl. 260—940 **5 Claims**

1. An O-alkyl-O-(1-cyano-1-tert.-butylketonoxime)-thionophosphoric or phosphonic acid ester of the formula



in which
R is lower alkyl, and
R′ is lower alkyl or alkoxy.

3,911,056
FLUOROCARBON AMINO PHOSPHATES

Leonard Eric Houghton, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

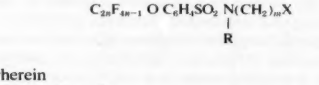
Filed Apr. 20, 1973, Ser. No. 352,987

Claims priority, application United Kingdom, Apr. 28, 1972, 19786/72

Int. Cl.² C07F *9/09*; **B29C** *1/04*

U.S. Cl. 260—944 **2 Claims**

1. A compound formula



wherein
n is 4, 5, or 6
R is an alkyl group containing from one to five carbon atoms or is hydrogen
m is an integer from one to six
and
X is OPO_3M_2
wherein M is hydrogen, alkali-metal, ammonium or ethyl or ethylol substituted ammonium.

3,911,057
N-BENZYLTHIOMETHYLENEPHOSPHONAMIDATES AND PHOSPHORAMIDATES

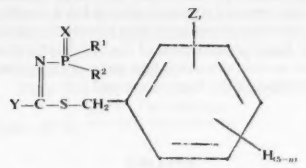
Leonard J. Stach, Riverside, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed July 1, 1974, Ser. No. 485,190

Int. Cl.² A01N *9/36*; **C07F** *9/24*, *9/44*

U.S. Cl. 260—948 **6 Claims**

1. A compound of the formula



wherein Y is selected from the group consisting of hydrogen and alkyl of from 1 to 3 carbon atoms; X is selected from the group consisting of oxygen and sulfur; R^1 and R^2 are independently selected from the group consisting of lower alkyl, lower alkoxy and lower alkylthio, provided a maximum of one of R^1 and R^2 is lower alkyl; and Z is selected from the group consisting of lower alkyl, halogen, lower haloalkyl and nitro.

3,911,058

O-(1,2-DIBROMO-2,2-DICHLORO-ETHYL)-PHOSPHORIC ACID DIESTER-AMIDES

Wilhelm Sirrenberg, Sprockhoevel; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

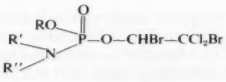
Filed Jan. 10, 1974, Ser. No. 432,775

Claims priority, application Germany, Jan. 19, 1973, 2302569

Int. Cl.² A01N *9/36*; **C07F** *9/24*

U.S. Cl. 260—950 **7 Claims**

1. An O-(1,2-dibromo-2,2-dichloro-ethyl)-phosphoric acid diester-amide of the formula



in which

R is alkyl of 1 to 12 carbon atoms, halo-lower alkyl, alkenyl with 2 to 6 carbon atoms, alkoxyalkyl with up to 6 carbon atoms per alkyl and alkoxy moiety, or phenylalkyl, and

R′ and R″ each independently is hydrogen or alkyl of 1 to 8 carbon atoms.

3,911,059

PREPARATION OF ALKYLPHOSPHONOTHIOLATES

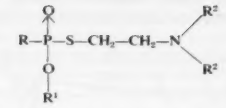
Sigmund R. Eckhaus, Baltimore, Md.; Jefferson C. Davis, Jr., Austin, Tex.; Bernard M. Zeffert, Baltimore, Md., and Thomas R. Moore, Hoboken, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 12, 1960, Ser. No. 62,305

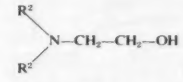
Int. Cl.² C07F *9/32*

U.S. Cl. 260—989 **3 Claims**

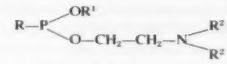
1. A method of preparing compounds of the formula



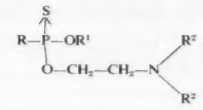
which comprises the steps of reacting a compound of the formula R—PX_2 with an alcohol of the formula R^1—OH to produce a compound of the formula R—$P(OR^1)_2$ reacting this compound with an aminoalcohol of the formula



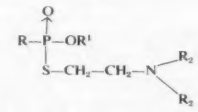
to produce a compound of the formula



reacting this compound with sulfur to produce a compound of the formula



which is then isomerized at a temperature in the range 70°–200°C. to proudce a compound of the formula



wherein X is selected from the group consisting of chloro, bromo, and iodo radicals, R, R^1, R^2 are lower alkyl radicals.

3,911,060

CONTROL SYSTEM FOR INJECTION COOLING TOWERS

Wilson E. Bradley, Jr., Ellicott City, and Edward N. Schinner, Silver Spring, both of Md., assignors to Baltimore Aircoil Company Inc., Jessup, Md.

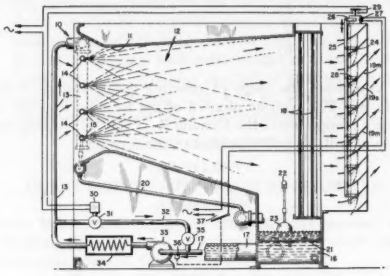
Division of Ser. No. 144,855, May 19, 1971, Pat. No. 3,785,626. This application Sept. 12, 1973, Ser. No. 396,645

Int. Cl.² B01D *3/04*

U.S. Cl. 261—27 **1 Claim**

1. An evaporative heat exchanger comprising an injector having means defining an air intake opening, an air and water mixing region, a region downstream of said air and water mixing region, means defining an exhaust opening, means to spray water into said air and water mixing region to induce air flow into said intake opening and flow concurrent with said water through said air and water mixing region and downstream region, means to collect the sprayed water, a return conduit connecting said collecting means to said spray means, a pump in said conduit, a bypass conduit, a normally closed valve in said bypass conduit, a normally open valve in said return conduit between said bypass conduit and said spray means, means responsive to the temperature of the water entering said pump to cause said normally open valve to move in a closing direction, when the temperature of the water entering said pump falls to a predetermined temperature which predetermined temperature is below the temperature of

the sprayed water, means responsive to water pressure increase at the outlet of said pump to cause said normally closed



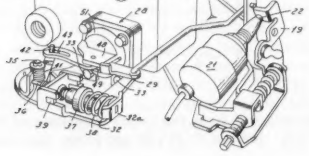
valve to move in an opening direction to maintain a substantially constant pump discharge pressure.

3,911,061

CARBURETOR ACCELERATOR PUMP CONTROL APPARATUS

Ernest J. Obermeyer, Jr., Orchard Lake, and Robert J. Reed, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 12, 1974, Ser. No. 460,655
Int. Cl.² F02M 7/08
U.S. Cl. 261—34 B **3 Claims**



1. In an internal combustion engine having a carburetor including an induction passage, a throttle valve pivotally mounted within said induction passage, an accelerator pump to inject fuel into said induction passage, said accelerator pump including an actuating lever, linkage means interconnecting said throttle valve and said actuating lever so that opening movement of said throttle valve results in actuation of the accelerator pump,

a temperature sensitive means having an element displaceable in relation to temperature,

and a fulcrum member movable in response to displacement of said element of the temperature sensitive means, said fulcrum member including a pivot means,

said accelerator pump lever being pivotally attached to said pivot means and movable about said pivot means to discharge fuel from said pump into the induction passage,

said accelerator pump lever having a slot formed therein,

the pivot means of said fulcrum member comprising a protruding pin,

said pin being slidably received within said slot and displaceable along the length of said slot to vary the effective length of said accelerator pump lever,

said accelerator pump lever being pivotally connected at one end to said linkage means and at the other end to said pivot means,

said accelerator pump lever being connected at an intermediate position to the main housing of the accelerator pump by means of a second pin and slot combination,

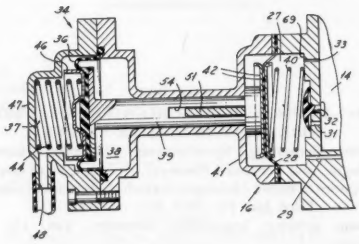
said first-mentioned slot extending essentially parallel to the general longitudinal extent of the accelerator pump lever and said second slot extending generally perpendicular to the direction of the first-mentioned slot.

3,911,062

TEMPERATURE RESPONSIVE ACCELERATING PUMP FOR AN INTERNAL COMBUSTION ENGINE CARBURETOR

Thomas R. Johnson, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 5, 1974, Ser. No. 491,596
Int. Cl.² F02M 7/08
U.S. Cl. 261—34 B **9 Claims**



1. An accelerating pump fuel supply system for an internal combustion engine carburetor, said carburetor including a source of intake manifold vacuum, an induction passage, a throttle lever and an accelerating pump,

said accelerating pump including a movable element displaceable to discharge fuel from said pump into said induction passage, the quantity of discharge from said pump being variable in direct relation to the magnitude of displacement of said movable element,

a second lever movable about a pivot axis to displace the movable element of said accelerator pump,

linkage means interconnecting said second lever and said throttle lever,

a vacuum motor including a movable member connected to the movable element of said accelerator pump,

a vacuum passage communicating said vacuum motor and a source of intake manifold vacuum,

said movable member being displaceable in response to changes in intake manifold vacuum, means transferring displacement of said movable member to said movable element,

a temperature responsive valve in said vacuum passage to open and close said vacuum passage in response to changes in temperature,

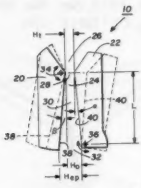
a full stroke of said vacuum motor displacing the movable element of said accelerating pump a predetermined distance,

a full stroke of said second lever displacing the movable element of said accelerating pump a distance less than said predetermined distance.

3,911,063
VARIABLE THROAT VENTURI APPARATUS FOR MIXING AND MODULATING LIQUID FUEL AND INTAKE AIR TO AN INTERNAL COMBUSTION ENGINE

Casper William Barnes, Jr., Newport Beach, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed July 18, 1974, Ser. No. 489,671
Int. Cl.[2] F02M *9/06*
U.S. Cl. 261—50 R **10 Claims**

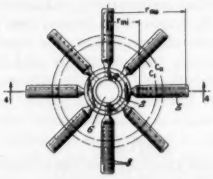


1. In a liquid fuel and intake air mixing and modulating device for supplying a combustion mixture to an internal combustion engine as a high velocity air stream incurring sonic velocity over most of the operating range of the engine to which it is supplied by efficient kinetic energy conversion of the air stream to static pressure and including a housing; oppositely positioned members within said housing defining by their walls a venturi flow passage intervening therebetween; fuel intake means to receive quantities of liquid fuel to be introduced in a substantially uniform pattern into said passage; pivot support means for supporting said opposite members including a first pivot means supporting one of said members for rotational pivot thereabout and a second pivot means longitudinally displaced downstream from said first pivot means supporting the other of said members for rotational pivot thereabout, and operative means effective to concomitantly pivot both of said members about their respective pivot means in the same rotational direction for varying the flow area of said passage in correlation to operating demands imposed upon the engine while simultaneously maintaining the area ratio between the exit plane of said passage and the throat plane of said passage to within a predetermined range.

3,911,064
SYSTEM FOR GAS SPARGING INTO LIQUID

John R. McWhirter, Westport, Conn., and Jon G. Albertsson, Grand Island, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 132,483, April 8, 1971, Pat. No. 3,775,307, which is a continuation-in-part of Ser. No. 32,070, April 27, 1970, abandoned. This application Apr. 11, 1973, Ser. No. 350,795
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—87 **2 Claims**



1. A method for sparging gas into liquid comprising the steps of injecting into liquid one gas stream at lineal velocity of at least 5 feet per second and at volumetric flow rate of at least 0.06 actual cubic feet per second per square foot of horizontal area in a sparging zone as gas bubbles in a horizontal direction, and simultaneously orbiting said gas stream at tangential velocity of 18–26 feet per second and at rate such that the factor N^2D^2 is 30–70 feet^2 per second^2 about a common vertical axis so as to scribe a swept area when projected on the horizontal plane bounded by circles of minimum and maximum radii, wherein N is the speed of sparger arms and impeller blade rotation (in revolutions per second), and D is the diameter of the circle which is circumscribed by the tips of the sparger arm (in feet), each perpendicular to said vertical axis, the ratio of total cross-sectional area of said gas stream to said swept area being 0.006 – 0.06, thereby forming a multiplicity of discrete gas bubbles of 1/32 – ¼ inch in said sparging zone; flowing said liquid at lineal velocity of at least 2 feet per second downwardly through said sparging zone for gas injection therein; and discharging the downwardly flowing gas bubble-containing liquid from the lower end of said sparging zone.

2. Apparatus for sparging gas into liquid comprising:

a. pressurized gas supply means;

b. a vertically oriented rotatable shaft having a passageway therein joined at its upper end to said gas supply means;

c. an axial flow impeller fixedly attached to said rotatable shaft with outwardly extending blades intermediate said upper end and the shaft lower end aligned to flow liquid downwardly;

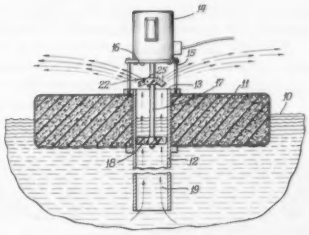
d. a multiplicity of gas sparging arms fixedly attached to said rotatable shaft at its lower end, each extending radially outwardly from and spaced around the shaft with the diameter scribed by the arm tips 0.8 – 1.1 times the diameter scribed by the impeller blade tips and each arm having an interior passageway communicating with the rotatable shaft passageway, and a single slot type opening in part of each arm end and extending therefrom along the trailing edge toward the inner end so as to scribe when projected on the horizontal plane a swept area bounded by the circles of minimum and maximum radii, said slot-type openings being provided in sufficient size that the ratio of total cross-sectional area of said openings to said swept area is 0.006 – 0.06; and

e. a multiplicity of vertical radial baffles at spaced intervals around the lower end of said rotatable shaft.

3,911,065
LIQUID AERATOR OR THE LIKE

Ernest J. Martin, Rolling Meadows, and Bernard A. Hurless, Rockford, both of Ill., assignors to Ernest J. Martin, Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 352,045, April 17, 1973, abandoned. This application July 30, 1973, Ser. No. 384,078
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—91 **15 Claims**



1. In a pump for use in connection with a body of liquid such as water having a surface, said pump being of the type having tube means about a vertical axis, a device connected to the tube means to support the tube means with the top of the tube means above the surface of the liquid and the bottom of the tube means below the surface, a shaft extending vertically in the tube means, a power drive connected to the shaft to rotate

the shaft in a given direction, and impeller means on the shaft with at least a portion of the impeller means below said surface to force liquid up the tube means to be expelled out the top of the tube means to fall back into the body of liquid, the improvement comprising:

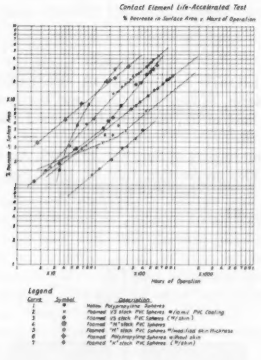
said impeller means having a part thereof imparting upward and outward components of movement to the liquid, said part having a surface inclined downwardly and forwardly with respect to the direction of rotation, said surface having a leading edge and a trailing edge, said trailing edge extending a radial distance from the shaft greater than any other portion of the impeller means which may be above said trailing edge, whereby as said impeller means is rotated the liquid is scooped up at said leading edge and discharged off said trailing edge, said tube means defining a passageway which is inside the tube means and in the location of the impeller means is between the impeller means and the tube means and which at the top has outwardly open sides, the open cross-sectional area of said passageway being approximately at least as large at all locations above the bottom of said impeller means as it is at the bottom of the impeller means so that there is no significant choking of the flow of liquid in an upwardly and outwardly path of movement from said part, said passageway providing a clear path for outward movement of the liquid to which said part is imparting said upward and outward components of movement.

3,911,066

SCRUBBER CONTACT ELEMENTS

Roy D. Ireland, Jr., and Francis E. Dahlem, both of Louisville, Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Nov. 9, 1973, Ser. No. 414,190
Int. Cl. B01d *47/14*
U.S. Cl. 261—94 **4 Claims**


Contact Element Life-Accelerated Test
% Increase in Surface Area v. Hours of Operation
Hours of Operation
Legend
Curve Symbol Description

1. An apparatus for providing contact between fluids which comprises: a flow-through housing having a dirty gas inlet at one end and a clean gas outlet at the opposite end defining a gas passageway therebetween;

a first element restraining grid disposed across one extremity of said passageway;

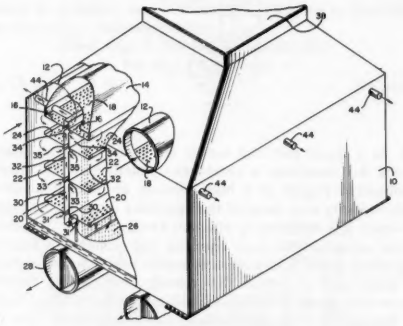
a plurality of spherical gas contact elements loosely disposed above said restraining grid, said contact elements being a closed cell foamed polymeric resinous material having a coating of non-foamed polymeric resinous material on the surface thereof, said coating of non-foamed polymeric resinous material being between 2 and 200 mils thickness, with a density in the range of between about 10 pounds per cubic foot and about 20 pounds per cubic foot, a compressive strength in the range of between about 1 psi and about 8 psi.

3,911,067

DIRECT CONTACT GAS CONDENSER

Tze-ning Chen, Princeton; John M. Burns, Hackettstown, both of N.J., and James M. Brandle, Easton, Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Oct. 9, 1973, Ser. No. 404,278
Int. Cl.² B01F *3/04*
U.S. Cl. 261—113 **6 Claims**



1. A direct contact condenser comprising:

a housing having at least one circulating liquid inlet and at least one circulating liquid outlet located below the circulating liquid inlet; a plurality of trays in the housing with all the trays in the housing being spaced from the housing walls and consisting of at least one tray set including a plurality of vertically spaced pairs of trays located in the liquid path from the circulating liquid inlet to a circulating liquid outlet, the horizontal separations between the trays in each pair of trays being equal and vertically aligned, each of the trays being provided with a plurality of holes sized for the liquid to flow at a predetermined rate of flow at a predetermined liquid level from the circulating liquid inlet to the circulating liquid outlet, said pairs of trays being dimensioned to provide space on the outsides of said tray set, said housing having at least one gas inlet at the top of the housing and above the circulating liquid inlet, said circulating liquid inlet being adapted to feed circulating liquid into a water header of less width than the width of the housing and having a bottom comprising a pair of bottom plates horizontally separated by an amount equal to the horizontal separation between the pairs of trays and having holes of a predetermined size; a solid vertical plate connected to the inner edge of each bottom plate, said solid vertical plates being interconnected by a solid top plate, and a gas outlet extends from the side of the outer vertical plate; and a perforated plate extends across the inside of the header above the header bottom plates, whereby gas entering the housing will flow along said space on the outsides of said tray set, and across the liquid path, and upwardly between the trays in each pair toward the gas outlet.

3,911,068

POOL CHLORINATION DIFFUSER

Jock Hamilton, 21322 Pacific Coast Highway, Malibu, Calif. 90265

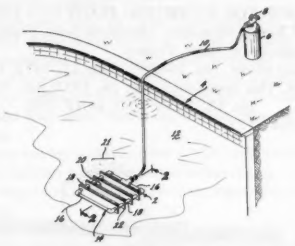
Filed July 2, 1973, Ser. No. 375,437
Int. Cl.² B01F *3/04*
U.S. Cl. 261—121 R **14 Claims**

1. A chlorine diffuser for direct chlorination of swimming pool water with gaseous chlorine comprising:

a manifold;

a plurality of porous plastic diffuser elements connected to said manifold for pressurization of the diffuser elements with gaseous chlorine from each of their ends in discharging chlorine through the porous elements into swimming pool water;

said diffuser elements having an outer surface which is water wettable but is not penetrated by water at a differential chlorine pressure of about 5 pounds per square inch;



said diffuser elements having microscopic pores which are sufficiently large to permit the passage of chlorine gas through said pores at a differential internal chlorine pressure of about 5 pounds per square inch and said pores ranging in sizes up to about 6 microns, and

said diffuser elements having a stretchability to provide self-cleaning in periodically cleansing the pores of the diffuser elements of contaminants found in liquid chlorine.

3,911,069

METHOD OF MANUFACTURING MULTILAYERED ARTICLES

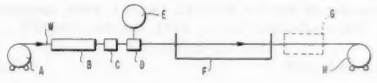
Hideo Fujita, Amagasaki; Kozo Hachisuka, Osaka; Kiyoshi Furukawa; Tsutomu Matsutani, both of Amagasaki; Kei Kobayashi, Ueda; Shiro Yonekura, Ueda; Akiyoshi Takano, Ueda, and Hiroshi Nakazawa, Ueda, all of Japan, assignors to Dainichi-Nippon Cables, Ltd., Amagasaki and Mitsuba Mfg. Co., Ltd., Tokyo, both of, Japan

Filed Nov. 13, 1972, Ser. No. 305,773

Claims priority, application Japan, Nov. 11, 1971, 46-90197

Int. Cl.[2] **B29C** *25/00*; **B29F** *3/10*

U.S. Cl. 264—23 **25 Claims**



1. A method for manufacturing a multilayered fabricated article which comprises extruding an uncured rubber or extrudable and then curable rubbery polymer material by a first extruder having a compression ratio of 1.2 to 3 into a vacuum chamber, reducing the size of the extruded composition in said chamber by comminuting or slicing to a small thickness with a cutter, feeding the comminuted or sliced pieces to a second extruder while maintaining the pieces under reduced pressure, extruding the composition by the second extruder around a core which has been dried and heated prior to said second extrusion to a temperature of at least 90°C, and at least the surface of the core being kept at a temperature not lower than the temperature which is 90°C lower than the curing temperature, and introducing the covered and shaped core without substantially bending or causing deformation of the same into curing means containing a heating medium, wherein said covered core is contacted with the heating medium which elevates the temperature of the uncured rubber or plastic composition, whereby the uncured rubber or plastic layer around the core is heated and cured at substantially atmospheric pressure, said first and second extruders being provided such that the sum of the L/D ratio of the first extruder and the L/D ratio of the second extruder does not exceed 24, and with the L/D ratio of said first extruder being at least 8.

3,911,070

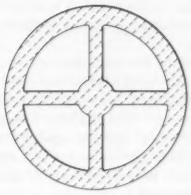
PROFILE EXTENSION PROCESS FOR THERMOPLASTIC RESINS AND CERAMIC THERMOPLASTIC RESIN BINDER COMPOSITIONS

Christian Bent Lundsager, Ashton, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 354,262, April 24, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,890

Int. Cl.[2] **B29D** *23/04, 27/00*; **C04B** *35/18*

U.S. Cl. 264—44 **7 Claims**



1. In a process for continously extruding thermoplastics in the form of a profile with one or more channels wherein each of said channels has a cross sectional diameter of about 0.01 to 0.25 inches, the improvement comprising including a material volatile at the extrusion temperature, selected from the group consisting of pentane, hexane, heptane and low boiling hydrocarbon oils to the plastic composition to prevent collapse of the profile during the extrusions and carrying out the extrusion at a temperature of about 200° to 600°F.

5. A process for preparing a ceramic structure in the form of a profile with one or more cavities that maintains its integrity during and after extrusion which comprises:

a. preparing a mixture made up of 5 to 50 volume percent of a polyolefin, 20 to 50 volume percent of a filler selected from the group consisting of cordierite, mullite, spinel, and alumina, 5 to 60 volume percent of a mineral oil plasticizer and 0.05 to 2.0 volume percent of a volatile material selected from the group consisting of pentane, hexane, heptane and low boiling hydrocarbon oils.

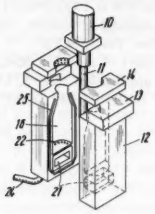
b. heating the mixture from 200° to 500°F. and extruding the material through a die containing a mandrel to form a tubular extrudate having one or more cavities therein. c. cutting the extrudate into sections and extracting the plasticizer,

d. heating to 300° to 700°C to burn off the polyolefin and, e. sintering at temperatures of 1400° to 1700°C. and recovering the product.

3,911,071
METHOD OF PRODUCTION OF A BOTTLE-SHAPED CONTAINER, FILLED, SEALED AND READY FOR SHIPMENT

Wilhelm Naumann, Ettlingen, Germany, assignor to PMD Entwicklungswerk fur Kunststoffmaschinen GmbH & Co. KG, Ettlingen, Germany

Filed Oct. 25, 1973, Ser. No. 409,714
Claims priority, application Germany, Nov. 20, 1972, 2256884
Int. Cl.² B29C *17/07*
U.S. Cl. 264—89 **1 Claim**



1. A method of producing a bottle-shaped, filled and sealed container comprising the steps of:

a. extruding a parison of thermoplastic material between a pair of mold halves of a separable mold defining, in a closed condition of the mold, a bottle-shaped cavity having a constricted neck-forming portion at the top of the mold cavity;

b. closing said mold on said parison to seal the bottom thereof and confine said parison in said mold cavity;

c. introducing fluid under pressure into said mold cavity and said parison through the top thereof in said neck-forming portion to blow said parison and force the same outwardly into contact with the wall of said cavity to conform said parison fully to said cavity and produce a bottle-shaped container;

d. filling said container with a substance to be stored therein;

e. enclosing a portion of said parison above said neck-forming portion in a head-forming cavity and sealing said container at the top thereof from the balance of said parison without conforming the container to the configurations of said head-forming cavity; and

f. introducing a fluid between said container and said bottle-shaped cavity at the bottom thereof at a pressure sufficient to deform a wall of said container inwardly and pressurize fluid within said container to deform said container outwardly into contact with the wall of said head-forming cavity, thereby producing a head on said container.

3,911,072
SINTERED MICRO-POWDER OF TETRAFLUOROETHYLENE POLYMERS

Takumi Saito, and Shigeki Hayashi, both of Shimizu, Japan, assignors to Mitsui Fluorochemical Co., Ltd., Tokyo, Japan

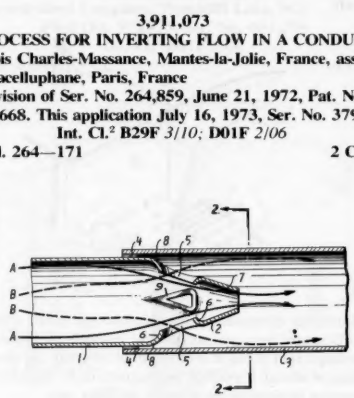
Filed Aug. 1, 1973, Ser. No. 384,504
Claims priority, application Japan, Aug. 9, 1972, 47-79104
Int. Cl.² C08J *3/06, 3/12*
U.S. Cl. 264—117 **7 Claims**

1. The process of preparing sintered micro-powders of tetrafluoroethylene polymer wherein the polymer is the homopolymer of tetrafluoroethylene, a non-melt fabricable copolymer of tetrafluoroethylene with a copolymerizable ethylenically unsaturated monomer or a melt-fabricable copolymer of tetrafluoroethylene and hexafluoropropylene or a perfluorovinyl ether, said micro-powder characterized by an average particle size between 1.9μ and 100μ, a sphere factor of 1.2 or less, a specific gravity of 2.20 or less and a weight loss on heating of 0.5 percent or less comprising atomizing an aqueous dispersion containing 5–80 percent by weight of tetrafluoroethylene polymer particles having 0.05 to 0.5μ average particle size into a gas at a temperature above the melting point of the tetrafluoroethylene polymer thereby causing the particles to sinter and coalesce and recovering the sintered micro-powder.

3,911,073
PROCESS FOR INVERTING FLOW IN A CONDUIT

Francois Charles-Massance, Mantes-la-Jolie, France, assignor to Lacelluphane, Paris, France

Division of Ser. No. 264,859, June 21, 1972, Pat. No. 3,802,668. This application July 16, 1973, Ser. No. 379,221
Int. Cl.² B29F *3/10;* **D01F** *2/06*
U.S. Cl. 264—171 **2 Claims**



1. In a process for producing cellulose films by extrusion of viscose from a hopper into an acidic coagulation bath, wherein the viscose is fed to the hopper through conduit means extending along a longitudinal axis while being contained by the inner periphery of the conduit means, the improvement comprising the steps of:

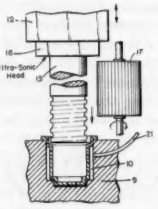
diverting the viscose flowing adjacent to the inner periphery of the conduit means toward the longitudinal axis of the conduit means, while simultaneously diverting a substantial portion of the viscose flowing adjacent to the longitudinal axis toward the inner periphery of the conduit; and then

containing the diverted viscose flows downstream of said diversions in an inverted state.

3,911,074
METHOD OF MAKING THIN-WALLED PLASTIC SCREW CAPS

Milton Kessler, 6690 Harrington, Youngstown, Ohio 44512

Continuation of Ser. No. 869,112, Oct. 24, 1969, abandoned. This application Nov. 1, 1971, Ser. No. 194,587
Int. Cl.² B29D *1/00*
U.S. Cl. 264—318 **2 Claims**



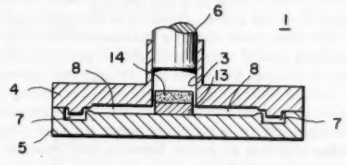
1. a. Method of making a thin-walled plastic screw cap having a uniform wall thickness of the thread portion of the cap comprising the steps of

b. providing a thin-walled unthreaded cup having a substantially cylindrical wall of substantially uniform thickness at all points along the wall;
c. inserting into said cup a threaded mandrel slightly larger in external diameter than the inside diameter of the cup while subjecting the cup to a sufficiently high temperature to soften its walls sufficiently so that the cup side wall hugs the mandrel and conforms closely to the threaded shape of the mandrel both at the inner surface and at the outer surface of the cup so as to retain its wall thickness substantially uniform,
d. allowing the cup to cool sufficiently to retain the threaded shape imparted to it by the mandrel,
e. unscrewing the thus threaded cup from the mandrel,
f. said cup being held in a retainer having a smooth-walled recess of sufficiently large diameter to accommodate the threaded cup after insertion of the mandrel, without binding,
g. said cup having a beaded rim which rests on the surface of said retainer when the cup is in the recess, said beaded rim being thicker, and therefore stronger, than the wall of the cup,
h. said unscrewing operation being accomplished by holding a rotating friction wheel against the said beaded rim of the cup so as to spin it off the mandrel, while holding the mandrel against rotation.

3,911,075
TRANSFER MOLDING THERMOSETTING POLYMERIC MATERIAL

Donald Edward Boesch, Trenton, and Yusuf Taher Koita, Lawrenceville, both of N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 28, 1974, Ser. No. 446,887
Int. Cl.[2] B29G *3/00*
U.S. Cl. 264—329 **8 Claims**

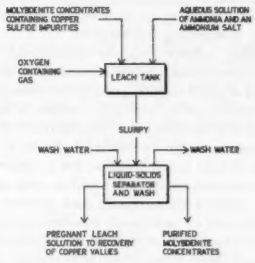


1. Method of filling a die cavity with a first thermosetting polymeric material, said method comprising:
a. positioning a first body of first thermosetting polymeric material of volume substantially equal to the volume of the die cavity adjacent said die cavity;
b. heating a second body of second thermosetting polymeric material and positioning said second body of second thermosetting polymeric material in contact with said first body;
c. pressurizing and deforming said second body against said first body while the viscosity of said second material is greater than the viscosity of said first material sufficiently to pressurize and deform said first body and force substantially all of said first material to flow into said die cavity, all of said second material remaining outside said die cavity,
d. thereafter permitting said first and second materials to set.

3,911,076
PROCESS FOR PURIFYING MOLYBDENITE CONCENTRATES

Thomas I. Probert; Kenneth J. Richards; Craig N. Wright, all of Salt Lake City, and Gerard E. Entrop, Sandy, all of Utah, assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,115
Int. Cl.[2] C01G *39/00*
U.S. Cl. 423—53 **9 Claims**



1. A process for selectively removing oxidized metal impurities of one or more of the metals cobalt, zinc, nickel and copper from a molybdenum concentrate containing same, comprising suspending such a molybdenite concentrate in an aqueous solution containing at least about 4 grams per liter of an ammonium salt and at least about 10 grams per liter of ammonia; maintaining the suspension at a temperature of from about 25°C to about 90°C for a time sufficient for said solution to selectively leach at least a substantial portion of said impurities from the molybdenite concentrate; and separating aqueous solution pregnant with said impurities from the purified molybdenite concentrate.

2. A process as claimed in claim 1 wherein the molybdenite concentrate suspended in the aqueous solution contains nonoxidized metal impurities which are converted to said oxidized metal impurities in-situ in said suspension by contacting said suspension with an oxygen containing gas.

3,911,077
TUNGSTEN RECOVERY FROM TUNGSTEN ORE CONCENTRATES BY CAUSTIC BAKING

Brice E. Martin; Joseph E. Ritsko, both of Towanda, Pa., and Robert E. Long, Jr., Williamstown, N.J., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 3, 1974, Ser. No. 502,858
Int. Cl.[2] C01G *41/00*
U.S. Cl. 423—58 **7 Claims**

1. A method for recovering soluble sodium tungstate from tungsten ore concentrates comprising leaching the concentrate in sodium hydroxide solution to produce soluble tungstate and caustic insoluble calcium hydroxide-containing sludge, diluting the leach solution with water, separating the leach solution from the sludge, and crystallizing the sodium tungstate from the solution, wherein the improvement comprises:
1. carrying out leaching by first baking a semi-solid mixture of the concentrate in sodium hydroxide solution having a concentration of at least 10 molar at a temperature of from 90°C to 150°C to a moisture level of from 10 to 25 percent to convert substantially all of the insoluble tungstates to sodium tungstate, followed by adding sufficient water to the semi-solid to form a slurry of solids in sodium hydroxide leach solution having a concentration below about 6 molar and to achieve substantially complete solubility of sodium tungstate therein, and
2. separating the leach solution from the sludge prior to the time when substantial reversal of the reaction and reformation of insoluble tungstates begins to occur.

3,911,078

METHOD FOR REMOVING ARSENIC AND ANTIMONY FROM COPPER ORE CONCENTRATES

Ravindra M. Nadkarni, Arlington; Charles L. Kusik, and Herman P. Meissner, both of Winchester, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Sept. 20, 1972, Ser. No. 290,442

Int. Cl. C01b 27/00, 29/00; C01g 29/00; C22b 31/00, 33/00, 37/00

U.S. Cl. 423—87 18 Claims

1. A method of treating an enargite copper ore containing arsenic and antimony to remove the arsenic and antimony therefrom, comprising the steps of

a. leaching copper enargite containing chemically combined arsenic and antimony with an aqueous leach solution of sodium sulfide, present in a concentration ranging between about 1.5 and 3.5 molar, containing hydroxyl ions in a concentration of between about 0.2 and 3 molar, at a temperature between about 80°C and the boiling point of said leach solution for a time sufficient to dissolve out essentially all of said arsenic and antimony and form sodium thioarsenate and sodium thioantimonate, the amount of said leach solution being that which will provide said sodium sulfide in a quantity between about two and three times the stoichiometric quantity required to react with all of the arsenic and antimony present in said ore concentrate;

b. filtering the resulting leach slurry at a temperature between about 60° and about 100°C to remove the arsenic and antimony-free copper ore concentrate from the leach liquor and to give a filtrate in the form of a pregnant solution containing said sodium thioarsenate and sodium thioantimonate dissolved therein;

c. removing said sodium thioarsenate and sodium thioantimonate from said pregnant solution by crystallization and subsequent filtration; and

d. subjecting said sodium thioarsenate and sodium thioantimonate to an acid treatment thereby to precipitate said arsenic and antimony as arsenic sulfide and antimony sulfide.

3,911,079

METHOD OF PRODUCING PHOSPHORIC ACID AND CALCIUM SULPHATE

Jean-Francois Gielly, Rouen, France, assignor to Rhone-Progil, Courbevoie, France

Continuation of Ser. No. 235,132, March 16, 1972, abandoned. This application Mar. 15, 1974, Ser. No. 451,454

Claims priority, application France, Mar. 23, 1971, 71.10132

Int. Cl.[2] C01F 1/00, 5/00; C01B 25/16

U.S. Cl. 423—167 7 Claims

1. A method of producing highly concentrated phosphoric acid having a P_2O_5 content of greater than 30% and calcium sulphate, comprising reacting calcium phosphate and sulphuric acid continuously in a plurality of successive reaction zones, with each of the calcium phosphate and sulfuric acid being distributed among the reaction zones to obtain a plurality of slurries having different compositions, concentrations, temperatures and types of crystals, filtering the slurry produced in each reaction zone successively beginning with the slurry from the zone containing the highest concentration of P_2O_5 and continuing with the slurries having a lower P_2O_5 content than the preceding slurry in a single filter whereby superimposed layers of solid material are deposited on the filter, water washing the layers of solid material filtered off to provide a dilute acidic wash water containing P_2O_5, introducing a major part of the dilute acidic wash water into the first reaction zone, introducing the filtrate from each reaction zone into a succeeding reaction zone so that the P_2O_5 concentration of the liquid phase of succeeding reaction zones is higher than that of preceding reaction zones, and collecting and removing from the last reaction zone the filtrate which constitutes the phosphoric acid product having a P_2O_5 content of at least 30% by weight.

3,911,080

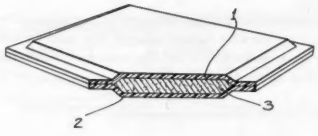
AIR POLLUTION CONTROL

Wolfgang Mehl, and Kurt Halfar, both of Geneva, Switzerland, assignors to H. Dudley Wright, Geneva, Switzerland

Continuation of Ser. No. 179,375, Sept. 10, 1971, abandoned. This application Sept. 7, 1973, Ser. No. 395,013

Int. Cl.[2] B01D 53/34

U.S. Cl. 423—210 14 Claims



1. A method for removing a pollutant selected from the group consisting of hydrogen sulfide, sulfur dioxide, aldehydes, mercaptans, organic sulfides, amines and alcohols from polluted air comprising bringing air containing said pollutant into contact with a gas-permeable and liquid impermeable membrane comprising an inert, finely divided, inorganic solid selected from the group consisting of activated carbon, graphite, ceria, zinc oxide, alumina and magnesium oxide dispersed throughout a solid, inert, hydrophobic polymer, allowing said pollutant to pass from said air through said membrane and into contact with an aqueous solution containing a reactant for said pollutant selected from the group consisting of an oxidizing agent or a reducing agent for said pollutant and allowing reaction to occur between said reactant and said pollutant, the period of contact of said air with said membrane being sufficient to reduce the concentration of said pollutant in said air, and thereafter withdrawing said air from contact with said membrane.

3,911,081

CATALYTIC OXIDATION OF NITRIC OXIDE IN MOLTEN SALT

Roy F. Maness, Richland; Raymond H. Moore, and Charles A. Rohrmann, both of Kennewick, all of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed June 28, 1972, Ser. No. 267,030

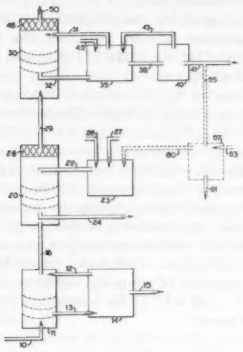
Int. Cl. B01d 53/34

U.S. Cl. 423—210.5 13 Claims

1. A process for treating a gaseous stream containing nitric oxide and oxygen, comprising the step:

contacting the gaseous stream with a molten alkali-metal sulfate solution of a temperature between 300° and 500° C containing a catalyst of vanadium pentoxide to catalyti-

cally oxidize the nitric oxide to a higher oxide of nitrogen, in which the molten alkali-metal sulfate solution com-



prises a mixture of sulfates selected from a group consisting of normal sulfates, acid sulfates, and pyrosulfates.

3,911,082

PREVENTION OF RESIN FORMATION DURING ABSORPTION OF CO_2 AND/OR H_2S FROM CRACKING GASES

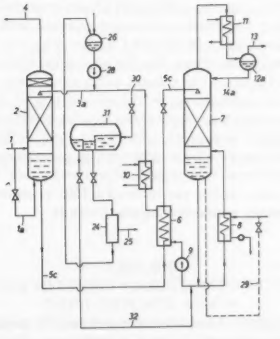
Friedrich Rottmayr; Hans Reimann, both of Pullach (Isartal); Robert Schuster, Munich; Walter Wagner, Hohenschaftlarn, and Hans Joachim Muller, Leverkusen, all of Germany, assignors to Linde Aktiengesellschaft and Erdolchemie Gesellschaft mit beschrankter Haftung, Cologne-Worringen, Germany

Division of Ser. No. 36,082, May 11, 1970, abandoned. This application Nov. 24, 1972, Ser. No. 309,264

Claims priority, application Germany, May 10, 1969, 1924052

Int. Cl. B01d *53/34*

U.S. Cl. 423—226 **9 Claims**



1. In a process comprising i) scrubbing a cracking gas containing a) resin precursors selected from the group consisting of dienes, higher acetylenes, unsaturated polycyclic or heterocyclic compounds, and polymerizable or condensible sulphur-containing compounds; and b) at least one member selected from the group consisting of carbon dioxide and hydrogen sulfide with c) a thermally regenerable aqueous alkaline scrubbing solution to absorb primarily said carbon dioxide and hydrogen sulfide, and ii) thermally regenerating the resultant loaded aqueous solution, the improvement which comprises: passing a liquid dispersion of a substantially water-immiscible organic solvent and an aqueous solution of potassium carbonate, alkanolamine or an aminocarboxylic, aminosulfonic or aminocarbonic acid salt through scrubbing and regenerating columns to separate and remove the resin precursors from the loaded aqueous solution during thermal regeneration of said loaded aqueous solution by preferential extraction of said resin precursors into said organic solvent.

3,911,083

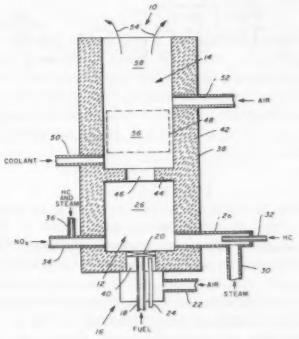
NITROGEN OXIDE CONTROL USING STEAM-HYDROCARBON INJECTION

Robert D. Reed, and Eugene C. McGill, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Feb. 24, 1972, Ser. No. 228,823

Int. Cl. B01d *53/34*

U.S. Cl. 423—235 **3 Claims**



1. A method to diminish NO_x in burning gases comprising the steps of:

burning a fuel with a substantially stoichiometric amount of combustion supporting gas or air in a first refractory lined chamber;

introducing gases containing said NO_x into said first chamber;

introducing a mixture of hydrocarbon gas and steam into said first chamber to provide therein a reducing atmosphere;

passing the resulting gas effluent at temperatures above 2000°F into a second refractory lined chamber;

rapidly cooling and maintaining said resulting effluent to a temperature within the range of 1250°to 2000°F; and

introducing air into said second chamber to burn excess combustibles.

3,911,084

PROCESS FOR SEPARATING SULFUR OXIDES FROM GAS STREAMS

Bruce Irving Wall, Escalon, Calif.; Henry Clinton Harris, Green River, Wyo., and Jose Luis Arnaud, Citrus Heights, Calif., assignors to FMC Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 259,061, June 2, 1972, abandoned. This application Feb. 20, 1973, Ser. No. 333,993

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—242 **13 Claims**

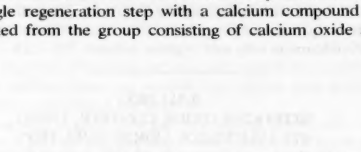
1. Process for removing gaseous sulfur oxides from a gas stream containing said sulfur oxides which comprises the steps of

providing a circulating aqueous extracting solution containing sodium sulfite and sodium bisulfite, and having a pH of about 6 to about 7;

contacting said gas stream in a gas-liquid contactor with said circulating extracting solution to form a liquid extract having a relatively higher sodium bisulfite content and a relatively lower pH;

recovering said extract;

regenerating at least a portion of the sodium bisulfite content of said extract to sodium sulfite by treatment in a single regeneration step with a calcium compound selected from the group consisting of calcium oxide and



calcium hydroxide in an amount sufficient to form an aqueous slurry containing dissolved sodium sulfite and solid calcium sulfite and having a pH of about 8 to about 10;

separating the solid calcium sulfite from said slurry so as to form a regenerated aqueous solution having a reduced sodium bisulfite concentration; and

comingling said regenerated aqueous solution with said circulating extracting solution so as to maintain the circulating extracting solution at pH of about 6 to about 7.

3,911,085

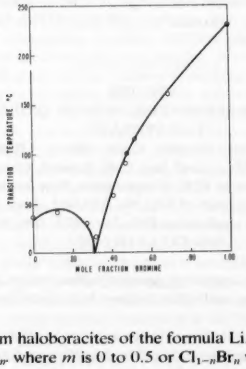
LITHIUM HALOBORACITES

Tom Allen Bither, Jr., and Wolfgang Karl Jeitschko, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 23, 1973, Ser. No. 408,278

Int. Cl. C01b *35/00*

U.S. Cl. 423—277 **4 Claims**



1. Lithium haloboracites of the formula $Li_4B_7O_{12}X$ wherein X is $I_{1-m}Br_m$ where m is 0 to 0.5 or $Cl_{1-n}Br_n$ where n is 0.2 to 0.5.

3,911,086

POTASSIUM AMMONIUM POLYPHOSPHATES

Richard C. Sheridan, Sheffield, and John F. McCullough, Florence, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 112,801, Feb. 4, 1971. This application July 28, 1971, Ser. No. 166,985

Int. Cl. C01b *15/16, 25/26*

U.S. Cl. 423—306 **24 Claims**

1. A process for the manufacture of long-chain crystalline potassium ammonium polyphosphates having the general formula $K_x(NH_4)_yP_nO_{3n+1}$, where n is greater than about 50, where $x+y=n+2$, and where the ratio y/x ranges from about 0.25 to about 4.0, which process consists of the steps of heating an ammonium phosphate selected from the group consisting of ortho-, pyro-, tripoly-, tetrapoly-, tetrameta-, long-chain polyphosphates, and mixtures thereof, with a potassium salt selected from the group consisting of potassium orthophosphate, metaphosphate, carbonate, chloride, and mixtures thereof, in a stream of ammonia vapor to a temperature between 200° C. and 400° C. for a period of from about 1 hour to about 16 hours.

3,911,087

SELECTIVE SOLVENT EXTRACTION OF SULFATE IMPURITIES FROM PHOSPHORIC ACID

Miguel O. Villarejos, Caparra Heights, P.R.; Tadeusz K. Wiewiorowski, New Orleans, and Willis L. Thornsberry, Jr., Gretna, both of La., assignors to Freeport Minerals Company, New York, N.Y.

Filed Oct. 19, 1973, Ser. No. 407,935

Int. Cl.[2] C01B *25/16*

U.S. Cl. 423—321 **18 Claims**

1. In the method for separating fluorine and sulfate impurities from phosphoric acid by solvent extraction which comprises contacting the acid with an extractant comprising a water immiscible organic liquid and an organic amine, and separating the organic extractant phase containing the fluorine and sulfate impurities from the aqueous acid phase:

the improvement whereby the sulfate impurities are selectively separated from the fluorine impurities in the final product acid of the solvent extraction, with the fluorine impurities remaining in the product acid, which comprises contacting a phosphoric acid containing fluorine and sulfate impurities and whose P_2O_5 concentration is about 35 to 44% by weight with an extractant comprising a water immiscible organic liquid and about 1 to 3 moles of a tertiary amine per mole of sulfate present in the acid, the tertiary amine having the formula:

wherein R_1 and R_2 are each selected from the group consisting of saturated and ethylenically unsaturated aliphatic groups containing from 1 to 20 carbon atoms, and R_3 is selected from the group consisting of saturated and ethylenically unsaturated aliphatic groups containing from 6 to 20 carbon atoms, in at least four counter-current extraction stages, to thereby produce a product acid leaving the last stage which still contains about 50 to 85% of its original fluorine content but only about 1 to 45% of its original sulfate content, and which has a sulfate selectivity factor, as defined in the specification, of about 2 to 4.

3,911,088
PROCESS FOR THE MANUFACTURE OF CRYSTALLINE BERYLLOALUMINOSILICATES

Laszlo Marosi, Ludwigshafen; Willi Ripperger, Frankenthal, and Matthias Schwarzmann, Limburgerhof, all of Germany, assignors to BASF Aktiengellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 15, 1973, Ser. No. 415,840
Claims priority, application Germany, Nov. 17, 1972, 2256450
Int. Cl.² C01B 33/28
U.S. Cl. 423—329 2 Claims

1. A process for the manufacture of crystalline beryl-loalumino-silicates, wherein an aqueous solution of sodium beryllate is added to sodium hydroxide and sodium aluminate, dissolved in water, the resulting solution is added, while stirring, to a sol of SiO_2 to prepare at room temperature a mixture having the molar composition (beryllate calculated as BeO):

$BeO/Al_2O_3 = 0.01$ to 0.5
$SiO_2/Al_2O_3 = 6$ to 30
$Na_2O/SiO_2 = 0.2$ to 0.6
$H_2O/Na_2O = 30$ to 70

this mixture is left for 18 to 24 hours and then heated to temperatures within the range of 50° to 105°C until a solid crystalline product has formed, and this product is then separated from the liquid, washed and dried.

3,911,089
PROCESS FOR PREPARING HYDROGEN CYANIDE

Tatsuo Shiraishi; Hiroshi Ichihashi, and Fumiyoshi Kato, all off Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Oct. 4, 1973, Ser. No. 403,722
Claims priority, application Japan, Oct. 6, 1972, 47-10085; Jan. 24, 1973, 48-10461
Int. Cl.² C01C 3/02; C07C 120/02
U.S. Cl. 423—376 23 Claims

1. A process for preparing hydrogen cyanide which comprises reacting methanol or formaldehyde or a mixture thereof, ammonia and oxygen in the presence of a catalyst composition at a temperature of 250° to 550°C. and a space velocity of 50 to 5,000 hour^{-1} under a pressure of 0.5 to 10 atmospheres, the said catalyst composition consisting essentially of a catalyst system of the formula: $Mo_aBi_bFe_cX_dY_eZ_fO_g$ wherein X is one or more of Cr, Mn, Co, Ni, Zn, Cd, Sn, W and Pb, Y is one or more of Tl and elements belonging to Group IA or IIA of the Periodic Table, Z is one or more of P, As and Sb and a, b, c, d, e, f and g each represent the number of atoms wherein a is 12, b is 0.1 to 15, c is 0.1 to 12, d is 2 to 15, e is 0 to 12, f is 0 to 5 and g is the total number of oxygen atoms and is a number determined by the valence requirements of the other atoms in the catalyst composition.

3,911,090
ALUMINUM HYDROXY CARBONATES NUCLEATED WITH SILICATE ANION

Stanley L. Hem, West Lafayette, and Joe L. White, Lafayette, both of Ind., assignors to Purdue Research Foundation, Lafayette, Ind.

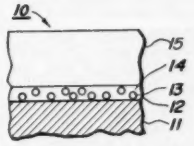
Filed May 14, 1973, Ser. No. 360,110
Int. Cl.² C01F 7/08; A61K 33/08, 33/10
U.S. Cl. 423—419 12 Claims

1. A crystalline aluminum hydroxy carbonate of the formula $M(Al[OH]_2CO_3)$ where M is Li^+, Na^+, K^+, or NH_4^+ prepared with 0.01 to 0.0001 mole of an alkaline metal silicate per mole of Al_2O_3 in the crystalline aluminum hydroxy carbonate inclusive of impurities therein.

3,911,091
MILLING TRIGONAL SELENIUM PARTICLES TO IMPROVE XEROGRAPHIC PERFORMANCE

Ronald E. Karam, Webster, N.Y., and David J. Swarthout, Arlington, Mass., assignors to Xerox Corporation, Stamford, Conn.

Filed June 21, 1974, Ser. No. 481,586
Int. Cl.² C01B 19/00; B02C 19/12
U.S. Cl. 423—510 7 Claims

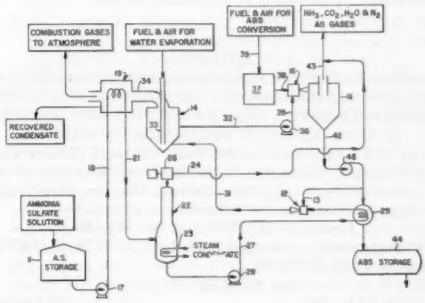


1. A method of improving the photoconductive properties of trigonal selenium which comprises providing a source of unmilled particulate trigonal selenium particles, said method comprising milling said particulate trigonal selenium to reduce the original particle size whereby said particles exhibit improved photosensitivity.

3,911,092
METHOD FOR CONVERTING AMMONIUM SULFATE TO AMMONIUM BISULFATE

Ormond Bretherick, Burlingame, Calif., assignor to Bohna Engineering & Research Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 125,079, March 17, 1971, abandoned. This application June 10, 1974, Ser. No. 477,779
Int. Cl.² C01C 1/24, 1/02
U.S. Cl. 423—520 11 Claims



1. A process for converting ammonium sulfate to ammonium bisulfate comprising the steps of:

forming a substantially anhydrous molten solution of ammonium sulfate and recycled ammonium bisulfate,

intimately dispersing and entraining the anhydrous solution within a hot gas stream in order to substantially instantaneously heat the solution to a temperature of at least approximately 600°F and convert substantially all of the ammonium sulfate to ammonium bisulfate,

separating the resulting molten ammonium bisulfate from gaseous products including the hot gases and ammonia resulting from the conversion of ammonium sulfate to ammonium bisulfate, and

recycling a portion of the molten ammonium bisulfate for forming said anhydrous solution.

3,911,093

RECOVERY OF SO_2 FROM WASTE GAS EMISSIONS

Fawzy G. Sherif, Spring Valley, N.Y.; John S. Hayford, and Julian E. Blanch, both of Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 190,000, Oct. 18, 1971. This application Oct. 5, 1972, Ser. No. 295,324

Int. Cl. C01b *17/00*

U.S. Cl. 423—574 14 Claims

1. A method for recovering sulfur from SO_2 containing gases which comprises (a) absorbing SO_2 in an absorbent comprising an aqueous solution containing an alkali metal phosphate at a pH between about 4.5 and about 2.5 at a temperature between about room temperature and about 200°F. in an absorption zone, (b) passing the SO_2 containing absorbent from said absorption zone, into a reaction zone, (c) introducing gaseous H_2S into said SO_2 containing absorbent in said reaction zone in an amount in excess of that required to react the SO_2 in said SO_2 containing absorbent to sulfur wherein said absorbent is maintained at a pH between about 2.5 and about 5.5 to produce sulfur, (d) separating sulfur from the absorbent and recycling the absorbent to said absorption zone.

3,911,094

METHOD OF PREPARING STABLE NIOOH

El Sayed Megahed, Madison; Patrick J. Spellman, Middletown, both of Wis., and Leif Tennare, Lund, Sweden, assignors to ESB Incorporated, Philadelphia, Pa.

Filed Jan. 28, 1974, Ser. No. 437,233

Int. Cl. C01g *53/04*

U.S. Cl. 423—592 9 Claims

1. A method for preparing stable tetravalent nickel oxyhydroxide, which method comprises mixing an alkali metal hydroxide selected from the group consisting of sodium hydroxide, potassium hydroxide, cesium hydroxide, lithium hydroxide and rubidium hydroxide with nickel hydrate and dry ozonating the resultant mixture, wherein the amount of alkali metal in the mixture is from about 5 to about 40 weight percent based on the weight of the nickel hydrate.

3,911,095

PREPARATION OF FERROMAGNETIC CHROMIUM DIOXIDE HAVING GRANULOMETRIC AND MAGNETIC CHARACTERISTICS VARYING WITHIN WIDE LIMITS AS WELL AS A NEW CHROMIUM DIOXIDE OF PARTICULAR GRANULOMETRIC CHARACTERISTICS

Ugo Montiglio; Giampiero Basile; Pierfrancesco Aspes, all of Alessandra, and Luigi Foco, Spinetta Marengo, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed June 28, 1973, Ser. No. 374,650

Claims priority, application Italy, June 30, 1972, 26474/72; June 30, 1972, 26475/72

Int. Cl.[2] C01G *37/02*

U.S. Cl. 423—607 17 Claims

1. In a process for the preparation of ferromagnetic chromium dioxide by heating at 300° – 500°C under an oxygen pressure of 30 – 1000atm. a starting material selected from the group consisting of:

a. a chromium (III) chromate $Cr_2(CrO_4)_3.nH_2O$ wherein the Cr^{6+}/Cr^{3+} molar ratio is between 1.2 and 1.9 and n is between 1 and 8; and

b. a mixture of chromium metal as such or passivated, with a chromium oxide with a valency above 4; the improvement consisting in regulating the heating of said starting material in such a way that the residence time of said starting material within the 200° – 300°C temperature range is between 20 and 35 minutes when using starting material (a) and is longer than 10 minutes but no longer than 35 minutes when using starting material (b).

7. In a process for the preparation of ferromagnetic chromium dioxide by heating at 300° – 500°C under an oxygen pressure of 30 – 1000 atm. a starting material selected from the group consisting of:

a. a chromium (III) chromate $Cr_2(CrO_4)_3.nH_2O$ wherein the Cr^{6+}/Cr^{3+} molar ratio is between 1.2 and 1.9 and n is between 1 and 8; and

b. a mixture of chromium metal as such or passivated, with a chromium oxide with a valency above 4: the improvement consisting in admixing with said starting material from 0.05 to 30% b.w. with respect to the chromium present in the starting material of a member selected from the group consisting of ammonia, oxalic acid, lactic acid, tartaric acid and citric acid, said group member being oxidised under the existing reaction conditions, thereby favoring the reduction of the starting material to CrO_2 through an exothermic reaction that is primed between 100° and 270°C.

3,911,096

RADIOIMMUNOASSAY FOR MEASUREMENT OF THYROXINE (T_4) AND TRIIODOTHYONINE (T_3) IN BLOOD SERUM

Inder J. Chopra, Torrance, Calif., assignor to Professional Staff Association of the Los Angeles County Harbor General Hospital, Torrance, Calif.

Filed June 23, 1972, Ser. No. 265,586

Int. Cl. A61k *27/04*

U.S. Cl. 424—1 11 Claims

1. A method of measurement of the concentration of a particular thyroid hormone selected from the group consisting of thyroxine (T_4) and triodo-L-thyronine (T_3) in unextracted human serum, which comprises:

A: adding, to a measured quantity of unextracted human serum,

a. a blocking agent in an amount sufficient to displace essentially all of said particular thyroid hormone to be measured from thyroxine-binding globulin (TBG),

b. buffering ions to buffer said serum to a pH of between about 6.8 to about 9.6,

c. radioactive thyroid hormone, of the type to be measured, in an amount which will give a measurable counting rate of either antibody bound or free radioactivity after reaction equilibrium has been reached as set forth in Step B below; and

d. an antibody in sufficient quantity to bind a significant quantity of said radioactive thyroid hormone in the absence of any of the particular non-radioactive thyroid hormone to be measured,

B: allowing reaction of both particular thyroid hormone, to be measured, and said radioactive thyroid hormone, with said antibody to proceed substantially to equilibrium to thereby produce antibody bound radioactive thyroid hormone;

C: separating said antibody bound radioactive thyroid hormone, to be measured from said free radioactive thyroid hormone;

D: measuring the quantity of radioactive thyroid hormone selected from antibody bound radioactive thyroid hormone and free radioactive thyroid hormone;

E: preparing a standard curve with known amounts of the particular thyroid hormone to be measured, and

F: correlating the quantity of radioactive thyroid hormone measured with a known amount of said particular thyroid hormone read from said standard curve.

3,911,097

ANTIGENIC PREPARATION SUITABLE FOR DIAGNOSIS OF CHRONIC CHAGAS DISEASE

William L. Hanson, Bishop, Ga., assignor to Research Corporation, New York, N.Y.

Filed Aug. 7, 1973, Ser. No. 386,285
Int. Cl.[2] A61K *39/00*; G01N *31/02*
U.S. Cl. 424—12 10 Claims

1. A purified water soluble antigen preparation capable of forming a precipitated antigen-antibody complex in an immunoprecipitin reaction when contacted with antibodies associated with chronic Chagas' disease, comprising an immunologically acceptable carrier in association with an immunoprecipitatingly effective concentration and amount of water soluble cellular antigens released by disruption of cells from essentially only the trypomastigote and amastigote growth stages of the protozoa *Trypanosoma cruzi*, substantially free from serum protein antibodies, from antigens associated with the epimastigote growth stage of said protozoa, and from water insoluble cellular material.

3,911,098

MEDICAMENT CARRIER

Richard Carl Capozza, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 11, 1974, Ser. No. 441,695
Int. Cl.[2] A61K *9/52*
U.S. Cl. 424—22 6 Claims

1. A method of dispensing an eye drug over a prolonged period of time comprising inserting in the conjunctival sac of the eye a bioerodible enzymatically cleavable ocular insert which is shaped to conform to the curvature of the eye and is adapted for insertion and retention in the conjunctival sac of the eye of an eye drug intimately dispersed in an uncoated matrix directly contacting the conjunctival sac of the eye of an enzymatically degradable form of poly(N-acetyl-D-glucosamine) selected from the group consisting of poly[N-acetyl-6-0-(carboxymethyl)-D-glucosamine], poly[N-acetyl-6-0-(2'-hydroxyethyl)-D-glucosamine, and poly[N-acetyl-6-0-(ethyl)-D-glucosamine], whereby the said form of poly(N-acetyl-D-glucosamine) is slowly enzymatically degraded by lysozyme in the tears over a period of time, and said eye drug is slowly thereby released into tears, and contacts the eyeball.

3,911,099

LONG-ACTING ARTICLES FOR ORAL DELIVERY AND PROCESS

George F. DeFoney, Philadelphia; Donald S. Mayes, Sunbury, both of Pa., and Henry S. Brenman, Cinnaminson, N.J., assignors to DeFoney, Brenman, Mayes & Baron, Cinnaminson, N.J.

Filed Jan. 23, 1974, Ser. No. 435,940
Int. Cl.[2] A61K *27/12*
U.S. Cl. 424—28 6 Claims

1. A product for the differential flavor release of odor-masking flavoring materials in the oral cavity of humans comprising a multiplicity of saliva solubilized micro-capsules, each microcapsule having an encapsulating surface encapsulating a predetermined quantity of essential flavoring oil or combinations thereof, the various microcapsules having different coatings materials and thicknesses in order to provide differential flavor release of odor-masking flavoring material over a period of time, and a pharmaceutically acceptable oral adhesive vehicle covering at least a portion of the surface of each of said microcapsules to provide said microcapsules with prolonged oral cavity residence time flavoring lasting as long as the saliva in the mouth dissolves the saliva-soluble microcapsules, thereby releasing the flavor contents until washed away by the secretions of the oral mucosa or until removed by the user from the mouth.

3,911,100

SUSTAINED RELEASE OF METHANTHELINE

James S. Y. Sim; Maurice H. Van Horn; Arthur I. Cohen; Stanley E. Gordesky, and Stanley I. Gordon, all of Rochester, N.Y., assignors to Union Corporation, Verona, Pa.

Filed Sept. 10, 1973, Ser. No. 395,786
Int. Cl.[2] A61K *27/12*
U.S. Cl. 424—22 19 Claims

1. A sustained release 846 hour after administration methantheline eluting multibarrier pharmaceutical composition comprising:

A. a polymerized and cured outer matrix of a water-insoluble but water-swellable hydrophilic polymer of a monomer mixture containing:
   1. polymerizable monoester of a member selected from the group consisting of acyrlic acid, methacrylic acid, and mixtures thereof; and a polyhydric alcohol;
   2. monoethylenically unsaturated ester selected from the group consisting of alkyl acrylates, alkyl methacrylates, vinyl esters of saturated monocarboxylic acids of up to 22 carbon atoms, and mixtures thereof, wherein the alkyl group of said methacrylate or acrylate contains from 1 to 22 carbon atoms; and
   3. polymerizable diester of a member selected from the group consisting of acrylic acid, methacrylic acid, and mixtures thereof; and polyhydric alcohol; and

wherein the monomer mixture contains from about 24 to about 49.3% by weight (A) (1); from about 34 to about 64.6% by weight of (A) (2); and from about 0.1 to about 1% by weight of (A) (3) based upon the total weight of (A) (1), (A) (2), and (A) (3) in the monomer mixture;

B. a polymerized and cured inner matrix within said outer matrix and being a water-insoluble but water-swellable hydrophilic polymer of a monomer mixture containing:
   1. polymerizable monoester of a member selected from the group consisting of acrylic acid, methacrylic acid, and mixtures thereof; and a polyhydric alcohol;
   2. a polymerizable sulfur-containing material selected from the group consisting of vinyl sulfonic acid, vinylpropane sulfonic acid, and styrene sulfonic acids, ammonium salts thereof; alkali metal salts thereof; and mixtures thereof; and
   3. polymerizable diester of a member selected from the group consisting of acrylic acid, methacrylic acid, and mixtures thereof; and a polyhydric alcohol; and

wherein the monomer mixture contains from about 25 to about 44.3% by weight of (B) (1); from about 5 to about 30% by weight of (B) (2); and from about 5 to about 25.2% by weight of (B) (3) based upon the total weight of (B) (1), (B) (2), and (B) (3) in the monomer mixture; and

C. said polymerized and cured inner matrix having been soaked for about 12 hours in isotonic saline solution containing per 5 ml of isotonic saline solution at least about 100 mg of methantheline bromide in an amount at least sufficient for the total dosage requirement adapted to gradually elute, upon administration during 864 hours of a treatment period; and thereby entrapping the methantheline bromide in said inner matrix.

3,911,101

FUMIGANT COMPOSITION CONTAINING A CHRYSANTHEMIC ACID ESTER

Yositosi Okuno, Toyonaka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 86,840, Nov. 4, 1970, Pat. No. 3,819,823. This application May 30, 1973, Ser. No. 365,278
Claims priority, application Japan, Nov. 14, 1969, 44-91617The portion of the term of this patent subsequent to June 25, 1991, has been disclaimed.
Int. Cl.[2] A01N *17/04*, *9/24*
U.S. Cl. 424—40 2 Claims

1. An insecticidal material consisting essentially of an effective amount of dl-2-allyl-3-methyl-cyclopent-2-ene-1-one-4-yl

d-trans-chrysanthemate absorbed on a fibrous support suitable for use on an electrically heated plate.

3,911,102

DENTIFRICES

Michael Harrison, Newcastle-upon-Tyne, England, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 182,142, Sept. 20, 1971, abandoned. This application Sept. 16, 1974, Ser. No. 506,670

Claims priority, application United Kingdom, Sept. 21, 1970, 44858/70; Nov. 27, 1970, 56577/70

Int. Cl.[2] A61K *7/16*

U.S. Cl. 424—49 **5 Claims**

1. A visually substantially clear dentifrice comprising about 5–50% by weight of a dentally acceptable substantially water-insoluble particulate polishing agent in a gel vehicle having substantially the same refractive index as said polishing agent, said polishing agent being a synthetic, amorphous complex aluminosilicate salt of an alkali metal of alkaline earth metal in which silica is interbonded with alumina and having a refractive index of about 1.44–1.47, up to about 20% by weight of moisture and up to about 10% by weight of alkali metal oxide or alkaline earth metal oxide and said polishing agent being substantially invisible in said liquid vehicle.

3,911,103

LIMONOATE DEHYDROGENASE AND DEBITTERING OF CITRUS PRODUCTS AND BY-PRODUCTS THEREWITH

Shin Hasegawa, Pasadena, and Linda C. Brewster, Carson, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation of Ser. No. 394,239, Sept. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 250,764, May 5, 1972, abandoned. This application Oct. 9, 1974, Ser. No. 513,362

Int. Cl.[2] A23B *7/10*

U.S. Cl. 426—51 **4 Claims**

1. A process for reducing the development of bitterness in a citrus material selected from the group consisting of citrus products and by-products which contain the limonin precursor, limonoate A-ring lactone, said process comprising

a. incorporating with the said citrus material the enzyme limonoate dehydrogenase, which enzyme is produced by culturing *Arthrobacter globiformis* on a nutrient medium containing limonoate ions, which has the specific ability of converting limonoate A-ring lactone into 17-dehydrolimonoate A-ring lactone, which exhibits optimum activity at a pH of about 9.5, and which requires for its activity the presence of nicotinamide-adenine nucleotide, and

b. incubating the said citrus material at a temperature and for a time sufficient to inactivate a substantial proportion of the limonin precursor contained in the citrus material.

3,911,104

GEL DENTIFRICES

Michael Harrison, Newcastle-Upon-Tyne, England, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 182,143, Sept. 20, 1971, abandoned. This application Sept. 16, 1974, Ser. No. 506,379

Claims priority, application United Kingdom, Sept. 21, 1970, 44858/70; Nov. 27, 1970, 56577/70

Int. Cl.[2] A61K *7/18*

U.S. Cl. 424—52 **8 Claims**

1. A visually substantially clear dentifrice comprising about 5–50% by weight of a dentally acceptable substantially water-insoluble particulate polishing agent in a gel vehicle having substantially the same refractive index as said polishing agent, said polishing agent being a synthetic amorphous complex aluminosilicate salt of an alkali metal or alkaline earth metal in which silica is interbonded with alumina and having a refractive index of about 1.44–1.47, up to about 20% by weight of moisture and up to about 10% by weight of alkali metal oxide or alkaline earth metal oxide and said polishing agent being substantially invisible in said liquid vehicle and an alkali metal fluorine-providing compound in amount which provides an effective, non-toxic amount of fluorine-containing ion.

3,911,105

FATTY COMPOSITIONS FOR USE IN COSMETIC MAKEUP COMPOSITIONS AND SAID COSMETIC MAKEUP COMPOSITIONS

Christos Papantoniou, Epinay-sur-Seine, and Jean Boulogne, L'Hay-les-Roses, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed June 7, 1974, Ser. No. 477,516

Claims priority, application Luxemburg, June 8, 1973, 67773

Int. Cl.[2] A61K *7/025*

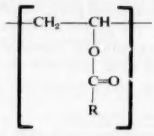
U.S. Cl. 424—64 **12 Claims**

1. A fatty composition for use in producing a cosmetic composition selected from the group consisting of a lip rouge and a mascara comprising a mixture of

i. at least one cosmetic fatty body consisting essentially of about 6–100 **100** percent of at least one cosmetic wax and 0–94 percent of at least one cosmetic oil and

ii. at least one non-toxic homopolymer selected from the group consisting of

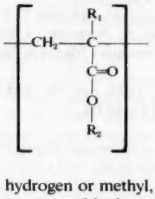
a. a homopolymer having repeating units of the formula



(I)

wherein R represents a saturated hydrocarbon chain, branched or linear, having 6-19 carbon atoms; and

b. a homopolymer having repeating units of the formula



(II)

wherein

R_1 represents hydrogen or methyl, and

R_2 represents a saturated hydrocarbon chain, branched or linear, having 10-°carbon atoms, said homopolymer having a molecular weight between 2,000 and 500,000 and said homopolymer being present in amounts of about 2-35 percent by weight relative to the total weight of the fatty composition.

8. A cosmetic composition selected from the group consisting of a lip rouge and a mascara comprising the fatty composition of claim **1** in an amount between 99.5–15 percent by weight of the total weight of the cosmetic composition, and a dyeing agent in an amount of 6–15 per-cent by weight, the amount of the homopolymer relative to the total weight of the cosmetic composition being at least 1.5 weight percent.

3,911,106

HAIR AND SCALP CONDITIONING COMPOSITION CONTAINING POLYTETRAFLUOROETHYLENE

Howard L. Scott, Philadelphia, Pa., assignor to Fabalon, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 358,897, May 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 128,534, March 26, 1971, abandoned. This application Jan. 4, 1974, Ser. No. 430,912

Int. Cl.² A61K *7/06*

U.S. Cl. 424—70 **4 Claims**

4. A hair and scalp conditioning composition comprising 3% by weight of polytetrafluoroethylene having a molecular weight of between about 1,000,000 and about 10,000,000 and a viscosity of greater than 10^{10} poises at 300°C, 1% by weight of a high molecular weight carboxyvinyl polymer comprising polyacrylic acid crosslinked with about 1% of polyallyl sucrose having an average of about 5.8 allyl groups for each sucrose molecule, 15% by weight of petrolatum, 5% by weight is isopropanol, 1% by weight of diisobutylcresoxyethyl dimethyl benzyl ammonium chloride monohydrate, 1% by weight of diethanolamine and the remainder of water.

3,911,107

IODINE COMPOSITION AND DISSIPATING SOLUTION

Joseph Z. Krezanoski, Los Altos, Calif., assignor to Flow Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Dec. 18, 1972, Ser. No. 315,793

Int. Cl.² A61K *31/74, 33/18*

U.S. Cl. 424—78 **17 Claims**

1. An aqueous, antiseptic, iodophor solution containing

a. from about 0.00005% to about 10% by weight iodine;

b. from about 0.001% to about 20% by weight of a water soluble iodide salt or hydriotic acid;

c. from about 0.001% to about 25% by weight polyvinyl alcohol; and

d. from about 0.001% to about 10% by weight boric acid.

13. A method of sterilizing contact lenses comprising:

a. placing said contact lenses in an aqueous solution comprising from about 0.01% to about 5% by weight sorbic acid or a soluble salt thereof; and from about 0.01% to about 5% by weight ethylenediaminetetraacetic acid or a soluble salt thereof; and

b. adding to said solution about 1.0% to about 10.0% by weight based on the total weight of the combined solutions, of an aqueous antiseptic iodophor solution containing from about 0.00005% to about 10% by weight iodine; from about 0.0001% to about 20% by weight of a water soluble iodide salt or hydriotic acid; from about 0.001% to about 25% by weight polyvinyl alcohol; and from about 0.001% to about 10% by weight boric acid.

3,911,108

PROCESS OF PRODUCING BOVINE MILK PRODUCTS CONTAINING SPECIFIC ANTIBODIES

Vipin K. Singh, deceased, late of Lima, Ohio (by Metropolitan Bank, executor), assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 14, 1973, Ser. No. 332,405

Int. Cl.² A61K *23/00*

U.S. Cl. 424—86 **18 Claims**

1. A bovine milk baby pig supplement product containing a prophylactically active quantity, effective in baby pigs to withstand a lethal-challenge infection of the pathogen of transmissible gastroenteritis that otherwise typically produces mortality in baby pigs, of anti-transmissible gastroenteritis antibodies comprising the colostrum, whole milk, decreamed colostrum, decreamed milk, whey, whey gamma globulin fraction, or mixtures thereof derived from the mammary gland secretions of a bovine that has been intramammarily stimulated with an immunogenic, pathogenic, or virulent living transmissible gastroenteritis virus, said milk product having been effectively treated with B-propiolactone or an equivalent chemical sterilant until it tests negative to bacteria, mycoplasma and viruses, and is thereby determined to be free of infectious microoganisms.

3,911,109

REARING CALVES

Raymond Kenworthy, Catworth, and Philip Porter, Putnoe, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 297,524, Oct. 13, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,781

Claims priority, application United Kingdom, Oct. 14, 1971, 47853/71

Int. Cl.² A61K *23/00*; **C12K** *3/00, 5/00*

U.S. Cl. 424—92 **5 Claims**

1. A method of immunising a calf against disorders of the intestinal tract, comprising causing the calf to eat or drink an orally non-toxic composition comprising the endotoxins of one or more pathogenic strains of the bacterium *E. coli*, said strains having the serotypes 08,09,015,078,0114,0137 or 0139, said endotoxins being stable to heating at 100°C and released by heat sterilization of the bacterium and thereby being substantially free from the living *E. coli* organisms and being administered to the calf in amounts sufficient to stimulate the intestine of said calf to produce antibodies to said pathogenic *E. coli* organisms, said amounts corresponding to a daily dose in the range 1–1,000 units of the endotoxins of each serotype.

3,911,110

INSECTICIDAL COMPOSITIONS

Wladimir A. Smirnoff, Ste. Foy, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Dec. 22, 1972, Ser. No. 317,535

Int. Cl.² A01N *15/00*

U.S. Cl. 424—93 **9 Claims**

1. An insecticidal composition comprising: (a) an enteric microorganism which is pathogenic to insects, and (b) the enzyme chitinase.

3,911,111

ENZYME INHIBITOR SPECIFIC AGAINST THIOL PROTEASE AND PROCESS FOR PRODUCTION THEREOF

Jiro Sawada, Kodaira; Tetsuo Misaki, Higashimurayama; Kazunori Hanada, Urawa; Masaharu Tamai, Tokorozawa; Michio Yamagishi, Tokorazawa; Hikoji Tsuji, Tokorazawa; Kyoko Komiya, Urawa; Takako Nakajima, and Junichi Machida, both of Tokyo, all of Japan, assignors to Taisho Pharmaceutical Co. Ltd., Tokyo, Japan

Filed Feb. 28, 1974, Ser. No. 447,038

Claims priority, application Japan, Mar. 6, 1973, 48-26389

Int. Cl.² C12D *13/06*; **C07G** *7/00*; **A61K** *35/00*

U.S. Cl. 424—118 **3 Claims**

1. A specific enzyme inhibitor, E-64, possessing an inhibitive activity against only thiol-enzymes, said specific enzyme inhibitor being a white needle-shaped crystal, being freely soluble in water, methanol, acetic acid, pyridine and dimethylsulfoxide, slightly soluble in ethanol and propanol, and insoluble in acetone, ethylacetate, chloroform, ethylether, benzene and petroleum ether; giving positive Sakaguchi, Greig & Leaback's peptide detection, Fiegl's dicarbonic acid detection and thio sulfate tests, giving negative Ehrlich, Molish, Tollens, anthrone, Elson-Morgan, nitroprusside, ninhydrin and Cu-Folin tests; having a degree of optical rotation $[\alpha]_D^{25} = 23.2°$ (C=1%, water); containing the elements of carbon, nitrogen, hydrogen and oxygen, having analytical value;

C, 48.94; N, 19.18; H, 7.38; O, 24.50

having a molecular weight of about 357 and corresponding to the empirical formula $C_{15}H_{27}N_5O_5$; consisting of L-leucine, agmatine and D-transepoxysuccinic acid in the ratio of 1:1:1, decomposing at about 233°C. not giving the definite melting

point, showing only the end absorption of water on an ultra violet spectrum, showing the characteristic bands of an infrared spectrum determined with tablets of KBr at 3280, 3120, 2960, 2870, 1645, 1610, 1555, 1470, 1445, 1390, 1305, 1285, 1255, 1235, 1205, 1175, 1155, 1138, 1125, 1095, 1078, 960, 897, 868, 770, 695 and 460 cm^{-1}, showing the signals of nuclear magnetic resonance spectrum at 60 MHz in D_2O containing 1 gutta of DCl at 0.95, 1.55, 3.16, 3.65 and 3.78 p.p.m. which are measured from the signals of an internal standard of sodium-2,2-dimethyl-2-silapentan-5-sulfonate, traveling 6.3 cm toward cathode as a unitary spot on a paper electrophoresis carried out on Toyo filter paper No. 51A in the pyridine-acetate buffer of pH 6.5 (pyridine-acetic acid-water, 10:0.4:90) for 30 minutes under 500 volts and revealing a single spot detected by Sakaguchi reaction at Rf 0.49, **0.16,** 0.13, 0.55 and 0.52 in the thin layer chromatography on silica gel H(Merck) developed with n-butanol-acetic acid-water (3:1:1), n-butanol-butyl acetate-acetic acid-water (4:2:1:1), n-propanol-ethyl acetate-acetic acid-water (70:20:2:8), n-propanol-water (7:3) and water, respectively.

3,911,112

ANTIBIOTIC SUBSTANCES AND PREPARATION

Surendra N. Sehgal, Dollard des Ormeaux; Kartar Singh, Beaconsfield, and Claude Vezina, Oka, Deux-Montagnes, all of Canada, assignors to Ayers, McKenna and Harrison Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 377,985, July 10, 1973, abandoned. This application May 6, 1974, Ser. No. 467,167

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—118 **5 Claims**

1. Antibiotic complex 484 which is obtainable by cultivating Streptomyces sp. NRRL 5490 in a culture medium containing a source of assimilable carbon and assimilable organic nitrogen and mineral salts until a substantial amount of the antibiotic complex is produced, which antibiotic complex 484

a. is soluble in water and methanol and substantially insoluble in acetone, ether, benzene, ethyl acetate and chloroform,

b. is convertible to acid addition salts,

c. gives two areas of antimicrobial activity 25 and 11 cm from the origin on descending paper chromatography at 24°C for 48 hours on Whatman No. 1 paper using a solvent system consisting of n-propanol, pyridine, acetic acid and water (30:20:6:20),

d. does not exhibit any characteristic absorption between 220 and **350** nm in its ultraviolet absorption spectrum,

e. has a representative infrared absorption spectrum in KBr as shown in accompanying FIG. **1,** showing bands at 3330, 2925, 2875 (sh), 1710, 1650, 1560 (sh), 1450, **1380,** 1170, 1080, 1030, 970 920 and 820 cm^{-1},

e. has a characteristic infrared absorption spectrum as shown in accompanying FIG. **1,**

f. inhibits the growth of *Staphylococcus pyogenes* (penicillin-sensitive), *Straphylococcus pyogenes* (penicillin-resistant), *Streptococcus faecalis*, *Escherichia coil*, *Aerobacter aerogenes*, *Salmonella pullorum*, *Pseudomonas aeruginosa*, *Proteus mirabilis*, *Proteus vulgaris*, *Klebsiella pneumoniae* and *Serratia marcescens*,

g. exhibits a LD_{50} (i.p., mice) of 350 – 450 mg/kg and a LD_{50} (p.o., mice) of > 1.0 g/kg,

h. has a specific rotation, $[\alpha]_D^{25} = -25° \pm 3°$ (methanol), and

i. gives a positive reaction to ninhydrin, a yellow color with Elson-Morgan reagent (i.e., a negative reaction), a negative reaction with Sakaguchi reagent and a positive reaction with silver nitrate reagent.

3,911,113

RECRYSTALLIZATION PROCESS FOR THE PURIFICATION OF NYSTATIN

Adam John Keseleski, Edison, and Gerd Wilhelm Michel, Princeton, both of N.J. assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 23, 1973, Ser. No. 325,966

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—123 **11 Claims**

1. A process for the purification of nystatin which comprises:

i. suspending nystatin in a solvent mixture comprising a water-miscible lower alkanol, water, and a solubilizing agent; said solubilizing agent having the formula

$$R_1—O—(CH_2—CH—O)_n—R_3$$

$$R_2$$

wherein n is 1, 2, or 3, R_1 is hydrogen, lower alkyl, aralkyl, or lower alkanoyl, R_2 is hydrogen or lower alkyl, and R_3 is hydrogen, lower alkyl or lower alkanoyl; and wherein the volume ratio of alkanol to solubilizing agent is from about 4:1 to about 1:1 and the volume ratio of alkanol to water is from about 10:1 to about 50:1;

ii. adjusting the pH of the suspension to between about 2.0 and about 4.5 to solubilize the nystatin and yield a solution;

iii. removing insoluble impurities from the solution;

iv. diluting the solution with water and adjusting the pH of the diluted solution to between about 4.0 and 8.0 to cause precipitation of amorphous nystatin and formation of a suspension;

v. heating the suspension to convert amorphous nystatin to crystalline nystatin; and

vi. recovering the crystalline nystatin.

3,911,114

COMPOSITION AND METHOD FOR TREATING STRESSED RUMINANTS

Bartley P. Cardon, Tucson, Ariz., assignor to Arizona Feeds, Tucson, Ariz.

Filed Jan. 26, 1973, Ser. No. 326,629

Int. Cl. A61k *27/00, 15/00*

U.S. Cl. 424—128 **15 Claims**

1. A method for treating stressed ruminant animals, comprising administering directly into the rumen thereof, an effective amount of an aqueous mixture of a composition containing on a dry weight basis, a major proportion of pregelatinized starch and minor proportions of vitamins and minerals which are physiologically beneficial to the ruminant animal being treated.

3,911,115

CYCLOHEPTAAMYLOSE-SILVER ALKANOL AMMINE COMPLEX COMPOUND

Andreas Hadhanyi, Eschweiler-Bergrath, Germany, assignor to H. Trommsdorff, Aachen, Germany

Filed Nov. 29, 1973, Ser. No. 420,245

Claims priority, application Germany, Dec. 11, 1972, 2260536

Int. Cl. C07g *3/00;* **C07c** *47/18*

U.S. Cl. 424—180 **8 Claims**

1. A molecular inclusion compound comprising a silver alkanol ammine complex and cycloheptaamylose having about 1 to 3 gram atoms of silver per 10 moles of cycloheptaamylose, the alkanol having about 2 to 5 carbon atoms.

8. A pharmaceutical composition comprising a germicidally effective amount of a molecular inclusion compound according to claim **1** together with a pharmacologically acceptable carrier.

3,911,116

PROCESS FOR PROMOTING WOUND HEALING WITH CHITIN DERIVATIVES

Leslie L. Balassa, Tomahawk Lake, Blooming Grove, N.Y. 10914

Continuation of Ser. No. 27,977, April 13, 1970, abandoned, which is a continuation-in-part of Ser. Nos. 619,007, Feb. 27, 1967, abandoned, which is a continuation of Ser. No. 704,538, Feb. 12, 1968, Pat. No. 3,632,754. This application July 19, 1973, Ser. No. 380,711. The portion of the term of this patent subsequent to Jan. 4, 1989, has been disclaimed.

Int. Cl.[2] A61K *31/70*

U.S. Cl. 424—180 4 Claims

1. A process for facilitating healing of a wound in a mammal which comprises topically administering a therapeutically effective dosage of a material selected from the group consisting of hydroxy lower alkyl chitin, carboxy lower alkyl chitin, lower alkyl chitin, chitin acetate, chitin phosphate, chitin nitrate, a salt of carboxy lower alkyl chitin and chitin citrate.

3,911,117

RAW FISH AND IRON CHELATED WITH GLUTAMIC OR RIBONUCLEIC ACID IN A MINK DIET

Fredrik Ender, Stasjonsvn. 5, 1310 Blommenholm, Norway

Continuation-in-part of Ser. No. 314,317, Dec. 12, 1972, abandoned. This application Sept. 26, 1974, Ser. No. 509,529

Claims priority, application Norway, Dec. 20, 1971, 4717/71

Int. Cl.[2] A23K *1/10, 1/18*

U.S. Cl. 424—180 4 Claims

1. An improved diet for fur-bearing animals, particularly mink, comprising raw marine fish and an iron containing additive, wherein the improvement comprises employing as the iron-containing additive ferric iron chelated with an organic acid selected from glutamic acid and ribonucleic acid.

3,911,118

NEMATICIDAL METHODS USING SUBSTITUTED PYRIDINYL PHOSPHONAMIDATE, PHOSPHONAMIDOTHIOSTE, PHOSPHORODIAMIDATE AND PHOSPHORODIAMIDO-THIOATE

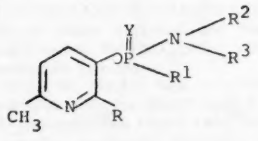
Frances O'Melia, Pleasant Hill, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 10, 1974, Ser. No. 468,845

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—200 12 Claims

1. A method for the control of nematodes in soil comprising applying to said nematode infested soil a nematicidal amount of a substituted pyridinyl compound corresponding to the following formula:



wherein Y represents a chalcogen of atomic number 8 to 16, inclusive; R represents hydrogen, methoxy, ethoxy, propoxy or isopropoxy; R^1 represents —NHmethyl, methyl or ethyl; R^2 represents hydrogen, methyl or ethyl, and R^3 represents methyl or ethyl.

3,911,119

ANTI-ARTHRITIC COMPOSITIONS COMPRISING LARGE RING GOLD-SULFUR-PHOSPHINE CHELATES AND METHODS OF PRODUCING ANTI-ARTHRITIC ACTIVITY

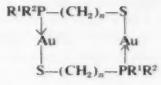
Blaine M. Sutton, Hatboro, and Joseph Weinstock, Phoenixville, both of Pa., assignors to Smithkline Corporation, Philadelphia, Pa.

Division of Ser. No. 384,665, Aug. 1, 1973, Pat. No. 3,842,108. This application July 17, 1974, Ser. No. 489,211

Int. Cl.[2] A61K *31/66, 31/28*

U.S. Cl. 424—209 8 Claims

1. A pharmaceutical composition having anti-arthritic activity, in dosage unit form, comprising a pharmaceutical carrier and an anti-arthritically effective but nontoxic amount of a compound of the formula:



in which:

R^1 and R^2 are each lower alkyl of from one to three carbon atoms, phenyl, phenyl substituted with a member selected from the group of alkyl, alkoxy or halogen, each alkyl or alkoxy having from one to three carbon atoms, or, when lower alkyl, are joined together with the phosphorus atom to which they are attached to form a ring; and

n is two to four.

3,911,120

PHOSPHONATED N,N-DISUBSTITUTED FATTY AMIDES AS BACTERICIDAL AND FUNGICIDAL AGENTS

Robert R. Mod, New Orleans; James A. Harris, Pearl River; Jett C. Arthur, Jr.; Frank C. Magne, both of Metairie; Gene Sumrell, New Orleans, and Arthur F. Novak, Baton Rouge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 26, 1973, Ser. No. 335,860

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—211 7 Claims

1. A process for inhibiting fungal growth, comprising contacting said fungus with an effective fungal growth inhibitory amount of a phosphonated N,N-disubstituted fatty amide selected from the group consisting of

N,N-Bis(2-ethoxyethyl)-9(10)-dibutylphosphonooctadecanamide,

N-Ethyl-N-(3-ethoxypropyl)-9(10)-dibutylphosphonooctadecanamide,

N,N-Dimethyl-9(10)-dibutylphosphonooctadecanamide, and

N-Methyl-N-butyl-9(10)-dibutylphosphonooctadecanamide.

3,911,121

TERPENE PHENOL RESIN COMPOSITIONS CONTAINING ORGANOPHOSPHORUS INSECTICIDES

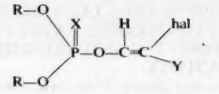
Lyman Richard Roberts, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

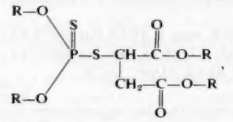
Continuation-in-part of Ser. No. 412,996, Nov. 5, 1973, abandoned. This application Sept. 6, 1974, Ser. No. 504,007

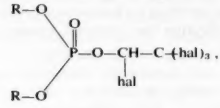
Int. Cl.[2] A01N *9/36*

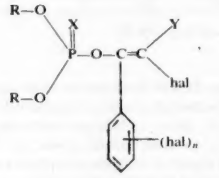
U.S. Cl. 424—219 4 Claims

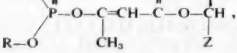
1. An insecticidal composition comprising an insecticidally effective amount of an organophosphorus compound selected from the group consisting of:

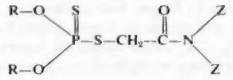
(1) 

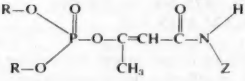
(2) 

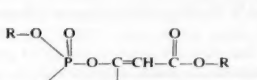
(3) 

(4) 

(5) 

(6) 

(7) 

(8) 

and

(9)

wherein each R, which may be the same or different, is alkyl of from one to four carbon atoms, X is oxygen or sulfur, Y is hydrogen or middle halogen, Z is hydrogen or alkyl from one to four carbon atoms, "hal" is middle halogen, and *n* is 2 or 3, in intimate admixture with a terpene phenol resin, having a softening point of at least 100°C, a phenolic hydroxy value of from about 0.14 to about 0.21 equivalent per 100 grams of resin and a molecular weight of about 620, the weight ratio of resin to insecticide being in the range of from about 8:1 to about 1:1.

3,911,122

INSECTICIDAL AND ACARIDIDAL SUBSTITUTED PHENYL THIOPHOSPHORIC ACID ESTERS

Jozef Drabek, Allschwil, and Denis Varsanyi, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

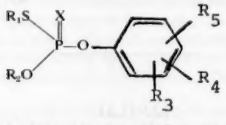
Division of Ser. No. 488,591, July 15, 1974, Pat. No. 3,867,525, which is a division of Ser. No. 292,218, Sept. 25, 1972, Pat. No. 3,839,509. This application Dec. 16, 1974, Ser. No. 532,975

Claims priority, application Switzerland, Sept. 30, 1971, 14208/71; July 27, 1972, 11229/72

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—225 **5 Claims**

1. An insecticidal or acaricidal composition comprising (1) an insecticidally or acaricidally effective amount of a compound of the formula



wherein R_1 is C_3–C_5 alkyl; R_2 is methyl or ethyl; R_3 is trihalomethyl in which at least one halogen is fluorine; R_4 and R_5 are each independently hydrogen, chlorine or bromine; and X is oxygen or sulphur; and (2) a suitable carrier.

3,911,123

PHARMACEUTICAL COMPOSITIONS UTILIZING 2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES AND METHOD OF EFFECTING CORONARY VESSEL DILATION AND TREATING HYPERTENSION IN HUMANS AND ANIMALS UTILIZING SAID COMPOUNDS

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

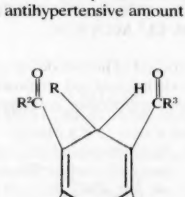
Division of Ser. No. 336,639, Feb. 28, 1973. This application Feb. 4, 1974, Ser. No. 439,305

Claims priority, application Germany, Apr. 14, 1973, 2210674

Int. Cl.[2] A61K *31/655, 31/435*

U.S. Cl. 424—226 **176 Claims**

1. A pharmaceutical composition useful for effecting coronary vessel dilation and for treating hypertension in humans and animals which comprises a coronary vessel dilating amount or an antihypertensive amount of a compound of the formula:



wherein

R is phenyl; substituted phenyl in which the substituents are one to three members selected from the group consisting of lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo(lower alkoxy), lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio and phenyl; or naphthyl

R^1 is hydrogen, lower alkyl or phenyl;
R^2 is lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy or lower alkynyloxy; and
R^3 is lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy or lower alkynyloxy
in combination with a pharmaceutically acceptable nontoxic inert diluent or carrier.

3,911,124
METHOD OF REDUCING THE UNDESIRABLE GASTROINTESTINAL EFFECTS OF PROSTAGLANDIN SYNTHETASE INHIBITORS

Andre Robert, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 28, 1974, Ser. No. 437,446
Int. Cl.[2] A61K *31/19, 31/61, 31/215, 31/415*
U.S. Cl. 424—234 **14 Claims**

1. In the process of systemic administration of an anti-inflammatory prostaglandin synthetase inhibitor to a mammal, the improvement which comprises concomitant systemic administration of an amount of a prostaglandin of the PGB-type effective to reduce the undesirable gastrointestinal effects of said prostaglandin synthetase inhibitor.

3,911,125
METHOD OF TREATING ANGINA PECTORIS, CORONARY INSUFFICIENCY, AND PREVENTING MYOCARDIAL INFARCTION

Marvin B. Bacaner, 4401 Fremont Ave. South, Minneapolis, Minn. 55409

Filed May 23, 1973, Ser. No. 363,012
Int. Cl.[2] A61K *31/14, 31/33, 31/155*
U.S. Cl. 424—244 **4 Claims**

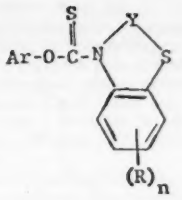
1. A method of treating angina pectoris and coronary insufficiency and aiding in preventing evolution of presumptive myocardial infarction in living human beings having such problems which comprises administering to said living human beings having such problems a small but effective amount of a post-ganglionic sympathetic blocking agent selected from the group consisting of bretylium tosylate, bethanidine and guanethidine sufficient to block the sympathetic nervous system and thereby relieving the interacting effect of prolonged spasmodic coronary constriction and increase in myocardial blood requirements which cause symptoms and ultimate death of myocardial tissue.

3,911,126
COMPOSITIONS COMPRISING THIOCARBAMIC ACID DERIVATIVES AND METHOD OF USING SAME

Horst Böshagen, Haan, Rhineland, and Manfred Plempel, Wuppertal-Elberfeld, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 292,484, Sept. 27, 1973, abandoned, which is a division of Ser. No. 25,557, April 3, 1970, Pat. No. 3,729,473. This application May 3, 1974, Ser. No. 466,719
Claims priority, application Germany, Apr. 5, 1969, 1917739
Int. Cl.[2] A61K *31/54*
U.S. Cl. 424—246 **20 Claims**

10. A method of treating mycotic infections in humans and animals which comprises administering to said human or animal an antimycotically effective amount of a compound having the formula:



wherein
Ar is phenyl or naphthyl, unsubstituted or substituted by halo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;
Y is $—CH_2CH_2—$, $—CH_2CH(CH_3)—$ or $—CH(CH_3)CH_2—$;
R is hydrogen, halo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylmercapto of 1 to 4 carbon atoms of trifluoromethyl; and
n is 1, 2 or 3,
in combination with a pharmaceutically acceptable non-toxic diluent or carrier.

3,911,127
SYSTEMIC PLANT PROTECTANT METHODS EMPLOYING CERTAIN PYRIDAZINES

Ronald Joseph Sbragia, Clayton, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 14, 1974, Ser. No. 451,666
Int. Cl.[2] A01N *9/22*
U.S. Cl. 424—250 **10 Claims**

1. A method for systemically controlling diseases of plant-life forms caused by soil-borne plant disease organisms selected from the group consisting of Verticillium, Rhizoctonia, Phytophthora, Pythium and Thielaviopsis which comprises applying an effective non-phytotoxic, amount of from 0.1 to about 10 pounds per acre a plant protectant selected from the group consisting of 6-(4-methylphenyl)tetrazolo(1,5-b)pyridazine and 6-(4-chlorophenyl)tetrazolo(1,5-b)pyridazine to plant life forms or their environment to thereby permit assimilation thereof by said plant life form to systemically control the plant disease.

3,911,128
SUBSTITUTED PURINES AS HYPOLIPIDEMICS

Mario G. Buzzolini, Morristown, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 224,327, Feb. 7, 1972, Pat. No. 3,836,656. This application June 24, 1974, Ser. No. 482,242
Int. Cl.[2] A61K *27/00*
U.S. Cl. 424—253 **2 Claims**

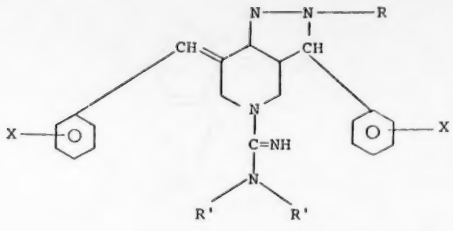
1. A method for treating lipidemia, which comprises orally administering to a mammal in need of said treatment a hypolipidemic effective amount of d-9-[(2,2-dimethyl-1,3-dioxol-4-yl)methyl]adenine.

3,911,129
PYRAZOLO-PYRIDINE BIOLOGICALLY ACTIVE COMPOUNDS

John Krapcho, Somerset, and Chester Frank Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 1, 1974, Ser. No. 484,730
Int. Cl. C07d *57/04*
U.S. Cl. 424—256 **4 Claims**

1. A compound of the formula



wherein X is F, Cl, alkyl of from 1 to 4 carbon atoms, H, alkoxy of from 1 to 4 carbon atoms, or CF_3; R is hydrogen, alkyl of from 1 to 4 carbon atoms, phenyl alkyl wherein the alkyl group is from 1 to 4 carbon atoms or X-substituted phenyl alkyl wherein X is as previously defined and the alkyl group is from 1 to 4 carbon atoms, hydroxy alkyl of from 1 to 4 carbon atoms or alkanoyl of from 1 to 4 carbon atoms; and R′ is hydrogen or alkyl of from 1 to 4 carbon atoms; and N-oxides and pharmaceutically acceptable acid addition salts thereof.

3,911,130

NOVEL 7-AZAINDOLE FUSED HETEROCYCLIC COMPOUNDS FOR PRODUCING ANALGESIA

David R. Herbst, Wayne, and Kurt W. Ledig, Philadelphia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

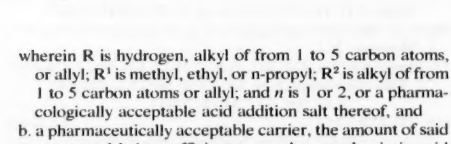
Division of Ser. No. 352,375, April 18, 1973, Pat. No. 3,880,866, which is a continuation-in-part of Ser. No. 248,999, May 1, 1972, abandoned. This application Sept. 23, 1974, Ser. No. 508,136

Int. Cl. A61k *31/47*

U.S. Cl. 424—258 **7 Claims**

1. A composition suitable for administration to a warm-blooded animal comprising:

a. a compound of the formulae:



wherein R is hydrogen, alkyl of from 1 to 5 carbon atoms, or allyl; R^1 is methyl, ethyl, or n-propyl; R^2 is alkyl of from 1 to 5 carbon atoms or allyl; and *n* is 1 or 2, or a pharmacologically acceptable acid addition salt thereof, and

b. a pharmaceutically acceptable carrier, the amount of said compound being sufficient to produce analgesia in said warm-blooded animal.

3,911,131

TRANQUILIZERS

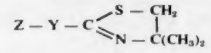
Herbert L. Wehrmeister, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Division of Ser. No. 312,075, Dec. 4, 1972, abandoned. This application May 28, 1974, Ser. No. 473,534

Int. Cl.² A61K *9/20, 31/44*

U.S. Cl. 424—263 **10 Claims**

1. A method of tranquilizing warm-blooded animals comprising administering thereto tranquilizing amounts of a compound or a pharmaceutically acceptable salt thereof, corresponding to the formula



wherein Z is phenyl, p-chlorophenyl, p-methoxyphenyl, 3-nitrophenyl, 3,4-methylenedioxophenyl, p-acetamidophenyl or pyridyl; Y is $-(CH_2)_n-$ where n is 1 or 2 or -CH=CR and R is hydrogen or methyl.

3,911,132

TREATING LIPIDEMIA WITH 1-TERTIARY-BUTYL-3-ARYL-2,1-BENZISOXAZOLINES AND COMPOSITIONS THEREFOR

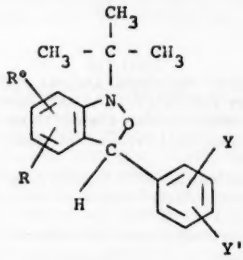
Robert V. Coombs, Chatham, and Goetz E. Hardtmann, Florham Park, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Feb. 25, 1974, Ser. No. 445,268

Int. Cl.² A01N *9/22, 9/28;* **A61K** *31/42*

U.S. Cl. 424—272 **13 Claims**

1. A method for treating lipidemia comprising administering to mammals in need of said treatment an effective amount of a compound of the formula:



wherein

R° and R are independently hydrogen, halo of atomic weight of from 18 to 80, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms or trifluoromethyl.

Y and Y′ are independently hydrogen, halo of atomic weight of from 18 to 80, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms or trifluoromethyl.

3,911,133

COMPOSITIONS CONTAINING ANTIBACTERIAL BIS(IMIDAZOLIUM QUATERNARY SALTS) AND METHODS OF USING SAID SALTS

Philip Neil Edwards, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

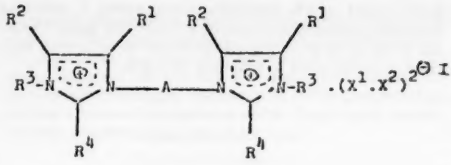
Division of Ser. No. 293,058, Sept. 28, 1972, Pat. No. 3,853,907. This application July 29, 1974, Ser. No. 492,841

Claims priority, application United Kingdom, Oct. 14, 1971, 47796/71

Int. Cl.² A61K *7/22;* **A01N** *9/22;* **A61K** *31/415*

U.S. Cl. 424—273 **10 Claims**

1. An antibacterial composition comprising an antibacterially effective amount of an imidazole derivative of the formula:



wherein R^1 and R^2 are hydrogen atoms or R^1 and R^2 together form a fused benzene ring; R^3 is an alkyl radical of 6 to 14 carbon atoms, a benzyl radical bearing 0 to 5 chlorine substituents in the benzene ring thereof, or a 3-alkoxy-2-hydroxypropyl radical wherein the alkoxy part is of 4 to 8 carbon atoms; R^4 is hydrogen or an amino radical or an alkyl radical of 1 to 3 carbon atoms; $(X^1.X^2)^{2-}$ represents two mono-anions or a di-anion; and A is a linking group selected from:

1. $-(CH_2)_n-$
2. $-CH_2.CH(OH).CH_2-$
3. $-(CH_2)_2.(OCH_2CH_2)_p.O(CH_2)_2-$
4. $-(CH_2)_mCO.NH(CH_2)_nNH.CO(CH_2)_m-$
5. $-CH_2CO.NH(CH_2)_5O(CH_2)_5NH.COCH_2-$ or
6. $-(CH_2)_r.Z.(CH_2)_r-$

wherein n is 2 to 12, m is 1 or 2, p is 0 to 2, r is 1 to 4 and Z is a phenylene, naphthylene or phenylenedioxy radical, or an alkylenedioxy radical of 2 to 12 carbon atoms, together with an inert diluent or carrier.

3,911,134

FUNGICIDAL WOOD PROTECTANT COMPOSITIONS

Ernst-Heinrich Pommer, Limburgerhof; Wolfgang Reuther, Ziegelhausen; Reimer Goettsche, Baden-Baden, and Heinrich Poppen, Sinzheim, near Baden-Baden, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 12, 1974, Ser. No. 488,001

Claims priority, application Germany, July 17, 1973, 2336290

Int. Cl.[2] A01N *9/20, 9/22, 9/24*

U.S. Cl. 424—274 **2 Claims**

1. A wood protectant composition comprising a fungicidal mixture of

a. the aluminum salt of N-nitroso-N-cyclohexylhydroxylamine, and

b. N-fluorodichloromethylthiophthalimide or N,N-dimethyl-N′-phenyl-(N′-fluorodichloromethylthio) sulfamide in a weight ratio of (a):(b) of 1:1 to 4:1.

3,911,135

BIOCIDAL SOLUTIONS FOR USE IN POLYVINYL HALIDE RESIN COMPOSITIONS

George Tirpak, East Brunswick, and Robert J. Stanaback, Gladstone, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Division of Ser. No. 321,187, Jan. 5, 1973, Pat. No. 3,833,520. This application Sept. 17, 1973, Ser. No. 398,149

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—274 **7 Claims**

1. A storage stable composition having fungicidal and bactericidal properties which consists essentially of a solution of about 1% and 3% by weight of N-trichloromethylthiophthalimide in a solvent selected from the group consisting of diethylene glycol dibenzoate, dipropylene glycol dibenzoate and mixtures thereof.

3,911,136

1-(O-METHOXY-PHENOXY)-3-ISOPROPYL-AMINO-PROPANE-2-OL HCL AND NITROGLYCERINE CORONARY INSUFFICIENCY COMPOSITION

Giorgio Ferrari, Milan, Italy, assignor to Simes Societa Italiana Medicinali e Sintetici S.p.A., Milan, Italy

Filed May 1, 1974, Ser. No. 466,056

Int. Cl.[2] A61K *31/21, 31/135*

U.S. Cl. 424—298 **2 Claims**

1. A pharmaceutical composition for the treatment of coronary insufficiency comprising from 10 to 50 milligrams of the beta adrenergic receptor blocking agent 1-(o-methoxyphenoxy)-3-isopropylamino-propane-2-ol hydrochloride and from 0.5 to 2.5 milligrams of nitroglycerine.

3,911,137

PROCESS FOR PREPARING HIGHLY CONCENTRATED AQUEOUS SOLUTION OF A DOPA COMPOUND

Tomonori Miki, Fujimi, and Seiji Tanaka, Koganei, both of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Nov. 27, 1973, Ser. No. 419,392

Claims priority, application Japan, Dec. 11, 1972, 47-124158

Int. Cl.[2] A61K *31/195*

U.S. Cl. 424—319 **12 Claims**

1. A process for increasing the solubility of dopa, methyldopa or tyrosine in water, which comprises incorporating in an aqueous solution of dopa, methyldopa or tyrosine a high molecular weight substance selected from the group consisting of methylcellulose, hydroxypropyl cellulose, hydroxypropylmethyl cellulose and gelatine.

3,911,138

ARTIFICIAL BLOOD AND METHOD FOR SUPPORTING OXYGEN TRANSPORT IN ANIMALS

Leland C. Clark, Jr., Cincinnati, Ohio, assignor to Children's Hospital, Inc., of Cincinnati, Ohio, Cincinnati, Ohio

Filed Feb. 26, 1973, Ser. No. 335,454

Int. Cl.[2] A61K *31/025*

U.S. Cl. 424—352 **19 Claims**

1. An artificial blood comprising an aqueous emulsion containing emulsified particles having a particle size up to about 100 microns of a RES-phobic perfluorocyclocarbon, an emulsifying agent in a non-toxic non-hemolytic amount, and water, said particles contained in an amount sufficient to support an oxygen carrying function, said perfluorocyclocarbon having a vapor pressure which permits it to leave the RES without causing adverse gas collection in animal tissue.

3,911,139

PROCESS FOR CONTINUOUS ACCELERATED FERMENTATION AND RIPENING OF BEER

Hans-Carl Wolter, Clara-Zetkin Strasse 52, 1634 Rangsdorf; Martin Kruger, Schonhauser Allee 84, 1071 Berlin; Peter Liebs, Bersarinstrasse 15, 1034 Berlin; Jorg Mowius, Thurnagelstrasse 4, 117 Berlin-Kopenick, and Karl-Heinz Wolf, Leninallee 144, 1017 Berlin, all of Germany

Filed Sept. 24, 1973, Ser. No. 399,948

Int. Cl. C12c *11/14*

U.S. Cl. 426—16 **1 Claim**

1. A process for the accelerated continuous fermentation and ripening of bottom-fermenting beer having the quality of lager beer brands and an original wort content of between 10.0% and 13.0%, said process comprising propagating yeast in wort with an extract content of between 10.0% and 13.0% while heating it by fermentation to a temperature of between 16°C and 25°C, subjecting it to pressure upon the surface of the wort of between 0.4 kp/cm² and 0.7 kp/cm² and a dilution rate of between 0.04 h^{-1} and 0.065 h^{-1}, and simultaneously fermenting and ripening it in a high liquid column flowing from top to bottom and having a uniform temperature of

between 16°C and 25°C and a CO_2 pressure upon the top of the column of between 1.5 kp/cm² and 3.5 kp/cm².

3,911,140

PREPARATION OF CONCENTRATED STARTER CULTURES

Raymond John Walcot Osborne, Sutton; Anthony Thomas Miles, Ashford, and Nicholas Tilley, Rosedale Abbey, all of England, assignors to Milk Marketing Board, England

Filed July 2, 1973, Ser. No. 375,935

Int. Cl.² A23C *9/12, 19/02;* **C12K** *3/00*

U.S. Cl. 426—36 **10 Claims**

1. A process for producing a concentrated culture of a microorganism capable of converting lactose substantially completely to lactic acid and in which the culture contains at least 5×10^{10} organisms per ml. which comprises

a. propagating the microorganism in a nutrient medium at a pH of about 6 to 7 in a fermentation zone and circulating nutrient medium containing cultivated microorganism and lactic acid or salts thereof from the fermentation zone to a first chamber of a dialyser,

b. introducing a regenerating solution into a second chamber of the dialyser which is separated from the first chamber of the dialyser by a dialysis or diffusion membrane which is substantially impermeable to the micro-organism but which allows the nutrients and the lactic acid and salts thereof to pass through the membrane, said membrane presenting an area of at least 3 cm² per ml. of nutrient solution containing microorganism, the regenerating solution having a concentration of nutrient which is sufficiently high and a concentration of lactic acid and salts thereof which is sufficiently low so that (i) nutrients pass across the membrane from the regenerating solution to the nutrient medium containing cultivated microorganism and lactic acid or salts thereof, and (ii) lactic acid or salts thereof pass across the membrane from the nutrient medium containing cultivated microorganism and lactic acid or salts thereof to the regenerating solution,

c. recirculating to a fermentation zone a nutrient solution containing propagated microorganisms which is enriched in nutrients and depleted in lactic acid or salts thereof,

d. continuing the cultivation of the microorganism until there are at least 5×10^{10} organisms per ml. in the fermentation zone, and

e. thereafter withdrawing a culture containing at least 5×10^{10} organisms per ml. from the fermentation zone.

3,911,141

PREPARATION OF MEAT ANALOGUES

David Robert Farr, La Tour-de-Peilz, and Paul van de Rovaart, Chexbres, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Oct. 30, 1974, Ser. No. 519,231

Claims priority, application Switzerland, Nov. 22, 1973, 16454/73

Int. Cl.² A23J *3/00;* **A23L** *1/275*

U.S. Cl. 426—60 **9 Claims**

1. In a process for the production of a meat analogue which comprises subjecting proteins to a texturising treatment, the improvement which comprises incorporating a substance containing pigments produced by a mold of the genus Monascus in the proteins during said treatment in an amount sufficient to impart color to said meat analogue.

3,911,142

PROCESS FOR PREPARING A PROTEIN SNACK FOOD AND THE RESULTING PRODUCT

Henry J. Huelskamp, 724 S. Clifton, Park Ridge, Ill. 60068; John J. Collins, 1214 S. Ridge Ave., Arlington Heights, Ill. 60005, and James E. Devero, 119 N. Windsor Drive, Arlington Heights, Ill. 60004

Filed Sept. 28, 1973, Ser. No. 401,667

Int. Cl.² A23L *1/18*

U.S. Cl. 426—559 **9 Claims**

1. The process of making a protein snack food product having a high protein content comprising the steps of:

a. dry mixing:

	Range – %
Soy protein (having at least 70% protein)	15–50
Whey powder	10–17
Non-fat dry milk	10–50
Wheat Flour	7–15
Potato Flakes	7–15
Sodium bicarbonate	0.2–0.3
Sodium potassium tartrate	0.2–0.3
Water	20–30

b. adding water to the mix in sufficient amount to form a hydrated mass and bind said mass;

c. allowing the hydrated mass to rest for a sufficient time after the addition of water in step (b) to insure uniform dispersion of the water through to the interior of the mass;

d. rapidly adding more water to the mass to bring the mass to a condition of uniform stability;

e. shaping the mass into pieces of substantially the desired final configuration; and

f. subjecting the pieces to heat for a period of time sufficient to produce the desired product.

3,911,143

SUBSTITUTE PRODUCT FOR NONFAT DRY MILK AND METHOD FOR FORMING

John C. Colmey, Danville, and Marlene R. Henselman, Pleasanton, both of Calif., assignors to Foremost-McKesson, Inc., San Francisco, Calif.

Filed Aug. 20, 1970, Ser. No. 65,535

Int. Cl. A23c *21/00*

U.S. Cl. 426—583 **20 Claims**

1. In a method for forming a substitute for nonfat milk, the steps of mixing aqueous, edible whey with an amount of calcium hydroxide sufficient to form a whey buffer complex at a pH in excess of about 7.5 but less than 9.0 in which calcium

is uniformly distributed in complex form capable of controlled release of dissociated calcium ions to yield a low concentration of said ions, and thereafter adding and dispersing in excess of about 6% but less than 29% casein based upon total solids content thoroughly into said whey buffer complex using agitation to form a homogeneous stable dispersion of calcium caseinate distributed throughout the whey.

3,911,144
EGG PRODUCT

David R. Strong, Norwalk, Conn., and Sutton Redfern, White Plains, N.Y., assignors to Standard Brands Incorporated, New York, N.Y.

Filed Sept. 1, 1972, Ser. No. 285,775
Int. Cl. A23l *1/32*
U.S. Cl. 426—588 **12 Claims**

1. A substantially cholesterol and egg yolk free liquid egg product comprising from about 24 to about 99.5 percent by weight egg white and from about 0.005 to about 0.3 percent by weight xanthan gum, the amount of xanthan gum being sufficient to impart to said liquid egg product a degree of freeze-thaw stability greater than the freeze-thaw stability of the substantially cholesterol free liquid egg product not containing xanthan gum.

3,911,145
METHOD OF ENHANCING TEA FLAVOR AND AROMA, AND PRODUCT THEREOF

Jean-Paul Marion, Chexbres, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Aug. 9, 1972, Ser. No. 279,001
Claims priority, application Switzerland, Aug. 12, 1971, 11843/71; May 15, 1972, 7127/72
Int. Cl.[2] A23F *3/00*
U.S. Cl. 426—597 **9 Claims**

1. A beverage composition comprising a tea extract and an aromatic extract of a fruit selected from the group consisting of apricot, banana, apple, grape, date, plum, fig and mixtures thereof, said aromatic extract having a fruity aroma and containing aromatic constituents of said fruit, the aromatic extract content of the composition being below the perception threshold of the specific aroma of the fruit in a beverage reconstituted from said composition but sufficient to promote the taste and aroma characteristics of black tea in said beverage.

3,911,146
METHOD OF PRESERVING THE COLOR OF ANIMAL TISSUE

Hiramasa Hara; Muneharu Nakano, and Saburo Kamiura, all of Ehime, Japan, assignors to Seinankaihatu Co. Ltd., Japan

Continuation of Ser. No. 230,940, March 1, 1972, abandoned.
This application Mar. 13, 1974, Ser. No. 450,567
Claims priority, application Japan, Mar. 7, 1971, 46-13323; Nov. 16, 1971, 46-91064
Int. Cl.[2] A23L *1/27*
U.S. Cl. 426—265 **7 Claims**

1. A method of preserving the color of animal tissue containing hemoglobin or myoglobin as coloring agent which comprises contacting said tissue with the water-soluble ingredients of vegetal matter until change of color in subsequent heat treatment is reduced, said vegetal matter being an edible part from the group consisting of spinach, turnip, carrot, cabbage, radish, burdock, white muskmelon, celery, egg plant, cauliflower, broccoli, and shepherd's purse, the amount of said water-soluble ingredients contacted with 1 kilogram of said animal tissue being equal to the amount of water-soluble ingredients in 15 to 100 ml of the natural juices separated from the remainder of said vegetal matter by subjecting the comminuted vegetal matter of extracting pressure, and said amount of said water-soluble ingredients being effective for reducing said change in color.

3,911,147
STEAM CONVERSION PROCESS FOR PRODUCING DEGRADED CEREAL PRODUCTS

Harold N. Barham, and Harold N. Barham, Jr., both of 3205 46th St., Lubbock, Tex. 79413

Continuation of Ser. No. 747,825, July 26, 1968, abandoned. This application Oct. 6, 1971, Ser. No. 187,166
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—318 **26 Claims**

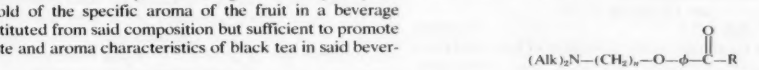
1. A process for making cereal grain products from raw whole cereal grains having the internal structures thereof more available for use, said grains having adsorbed into the grain kernel structure a reactive gas selected from the group consisting of sulfur dioxide, hydrogen chloride, ammonia, chlorine and mixtures thereof, which process comprises: subjecting said gas adsorbed grain to steam under a peak pressure of at least 85 p.s.i.g. to promote chemical reaction between said gases or their reaction products with the kernel structure to produce a cereal grain product.

3,911,148
METHOD FOR COLORING FRUITS AND VEGETABLES

Henry Yokoyama; Wan-Jean Hsu, both of Pasadena, and Stephen M. Poling, Seal Beach, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 404,980, Oct. 10, 1973, Pat. No. 3,864,501. This application Oct. 9, 1974, Ser. No. 513,664
Int. Cl.[2] A23L *1/272*
U.S. Cl. 426—268 **7 Claims**

1. A process for enhancing the coloration of harvested fruits and vegetables which contain carotenogenic tissue, which comprises applying to the surface of the fruit or vegetable a compound of the structure



wherein

Alk is lower alkyl of 1–4 carbon atoms, *n* is an integer from 2 to 4, and R is a member of the group consisting of H, lower alkyl of 1–4 carbon atoms, phenyl, —CH = CH—Ph, and —CH_2—CH_2—Ph, and holding the fruit or vegetable for a period long enough to develop an enhanced coloration.

3,911,149
METHOD FOR COLORING FRUITS AND VEGETABLES

Henry Yokoyama; Wan-Jean Hsu, both of Pasadena, and Stephen M. Poling, Seal Beach, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 404,980, Oct. 10, 1973, Pat. No. 3,864,501. This application Oct. 9, 1974, Ser. No. 513,422
Int. Cl.[2] A23L *1/272*
U.S. Cl. 426—268 **3 Claims**

1. A process for enhancing the coloration of harvested fruits and vegetables which contain carotenogenic tissue, which comprises applying to the surface of the fruit or vegetable a compound of the structure

$$(Alk)_2N-(CH_2)_n-O-\overset{O}{\overset{\|}{C}}-\phi-R'$$

wherein Alk is lower alkyl of 1-4 carbon atoms, n is an integer from 2 to 4 and R′ is a member of the group consisting of —OH, lower alkyl of 1-4 carbon atoms, and lower alkoxy of 1-4 carbon atoms, and holding the fruit or vegetable for a period long enough to develop an enhanced coloration.

3,911,150

METHOD FOR COLORING FRUITS AND VEGETABLES

Henry Yokoyama; Wan-Jean Hsu, both of Pasadena, and Stephen M. Poling, Seal Beach, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 404,980, Oct. 10, 1973, Pat. No. 3,684,501. This application Oct. 9, 1974, Ser. No. 513,423

Int. Cl.[2] A23L *1/272*

U.S. Cl. 426—268 **7 Claims**

1. A process for enhancing the coloration of harvested fruits and vegetables which contain carotenogenic tissue, which comprises applying to the surface of the fruit or vegetable a compound of the structure

$$(Alk)_2N-(CH_2)_x-CH_3$$

wherein

Alk is lower alkyl of 1–4 carbon atoms and x is an integer from 3 to 7, and holding the fruit or vegetable for a period long enough to develop an enhanced coloration.

3,911,151

METHOD FOR COLORING FRUITS AND VEGETABLES

Henry Yokoyama; Wan-Jean Hsu, both of Pasadena, and Stephen M. Poling, Seal Beach, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 404,980, Oct. 10, 1973, Pat. No. 3,684,501. This application Oct. 9, 1974, Ser. No. 513,431

Int. Cl.[2] A23L *1/272*

U.S. Cl. 426—268 **7 Claims**

1. A process for enhancing the coloration of harvested fruits and vegetables which contain carotenogic tissue, which comprises applying to the surface of the fruit or vegetable a compound of the structure

$$(Alk)_2N-(CH_2)_m-\phi-R'$$

wherein Alk is lower alkyl of 1–4 carbon atoms, m is an integer from 1 to 5, and R′ is a member of the group consisting of H, —OH, lower alkyl of 1–4 carbon atoms, and lower alkoxy of 1–4 carbon atoms, and holding the fruit or vegetable for a period long enough to develop an enhanced coloration.

3,911,152

METHOD FOR COLORING FRUITS AND VEGETABLES

Henry Yokoyama; Wan-Jean Hsu, both of Pasadena, and Stephen M. Poling, Seal Beach, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 404,980, Oct. 10, 1973, Pat. No. 3,684,501. This application Oct. 9, 1974, Ser. No. 513,666

Int. Cl.[2] A23L *1/272*

U.S. Cl. 426—268 **3 Claims**

1. A process for enhancing the coloration of harvested fruits and vegetables which contain carotenogenic tissue, which comprises applying to the surface of the fruit or vegetable a compound of the structure

$$(Alk)_2N-(CH_2)_n-O-\phi-\overset{O}{\overset{\|}{C}}-O-Alk$$

wherein

Alk is lower alkyl of 1–4 carbon atoms, and n is an integer from 2 to 4, and holding the fruit or vegetable for a period long enough to develop an enhanced coloration.

3,911,153

METHOD FOR COLORING FRUITS AND VEGETABLES

Henry Yokoyama; Wan-Jean Hsu, both of Pasadena, and Stephen M. Poling, Seal Beach, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 404,980, Oct. 10, 1973, Pat. No. 3,864,501. This application Oct. 9, 1974, Ser. No. 513,421

Int. Cl.[2] A23L *1/272*

U.S. Cl. 426—268 **3 Claims**

1. A process for enhancing the coloration of harvested fruits and vegetables which fruits and vegetables contain carotenogenic tissue, which comprises applying to the surface of the fruit or vegetable selected from the group consisting of apricots, peaches, cherries, nectarines, tomatoes, bell peppers, chili peppers, carrots, sweet potatoes, and citrus fruits, a compound of the structure

$$(Alk)_2N-(CH_2)_n-OH$$

wherein

Alk is lower alkyl of 1–4 carbon atoms and n is an integer from 2 to 4 and holding the fruit or vegetable for a period long enough to develop an enhanced coloration.

3,911,154

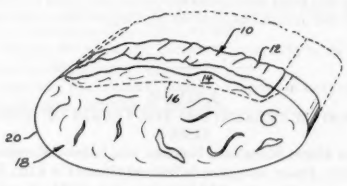
METHOD OF MAKING A NATURAL APPEARING MEAT PRODUCT

J. B. Weatherspoon, Fort Wayne, Ind., assignor to Peter Eckrich & Sons, Inc., Fort Wayne, Ind.

Continuation-in-part of Ser. No. 353,577, April 23, 1973, abandoned. This application June 15, 1973, Ser. No. 370,404

Int. Cl. A22c *18/00*

U.S. Cl. 426—282 **6 Claims**



1. A method of making a natural appearing meat product comprising the steps of:

a. providing a fat over having a lean side and an opposite fatty side;

b. providing a meat mixture capable of being stuffed through a stuffing horn;

c. placing the fat cover at least partially about a stuffing horn with said lean side inwardly;

d. surrounding the stuffing horn and the fat cover with a mold;

e. securing said fat cover to said mold;

f. directing said mixture through the stuffing horn into said mold while precluding substantial relative movement between said mold and said fat cover so that the mold is filled by said fat cover and said mixture; and

g. further processing the stuffed mold to cause said mixture to bind together and to said lean side.

3,911,155

METHOD FOR DECORATING RAW DOUGHS OF CONFECTIONARY PRODUCTS TO BE BAKED

Aldo Ferrero, Via Ampere 9, Milan, Italy (20131)

Filed Feb. 5, 1973, Ser. No. 329,305
Claims priority, application Italy, Feb. 10, 1972, 20457/72
Int. Cl.[2] A21D *8/02*
U.S. Cl. 426—296 2 Claims

1. A method for decorating the surface of raw doughs of confectionary products to be baked, comprising the steps of: providing a granule of previously puffed cereal;

covering said granule while heating with a layer of colored sugar; and

applying the covered granule to the surface of raw confectionary products prior to baking and baking the same; whereby

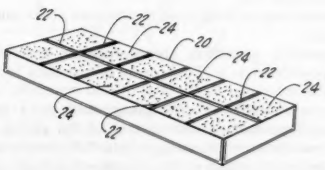
the granule is fully incorporated into the surface of the product, retaining unaltered its original color and form.

3,911,156

METHOD OF HANDLING FOODS

Alta S. Swanson, 1975 McLean Blvd. NW., Wichita, Kans. 67203

Filed July 30, 1973, Ser. No. 384,054
Int. Cl.[2] A23B *4/06*; B65B *55/00*
U.S. Cl. 426—393 2 Claims



1. A process for handling prepared foods comprising:

a. placing said prepared foods in a compartmentalized zone, said foods include up to about 35% wt. fatty acids and said fatty acids are selected from the group consisting of saturated fatty acids, unsaturated fatty acids, and mixtures thereof, said saturated fatty acids, have a melting point between about −4°C and 95°C, and said saturated fatty acids include between about 4 and about 26 carbon atoms and are selected from the group consisting of palmitic, lauric, myristic, stearic, caproic, caprylic, butyric, capric, and mixtures thereof, said unsaturated fatty acids have a melting point between about 10°C and 50°C, and said unsaturated fatty acids include between about 10 and 24 carbon atoms and are selected from the group consisting of linolenic, oleic, petroselinic, erucic, nervonic, linoleic, gadoleic, cetoleic, and mixtures thereof;

b. freezing said prepared foods with said compartmentalized zone, said compartmentalized zone is an ice cube tray;

c. removing said frozen foods of step (b) from said compartmentalized zone; and

d. repackaging said removed prepared frozen foods of step (c) in a packaging zone, said repackaging zone is a plastic bag; and

e. said process additionally including separating said saturated and unsaturated fatty acids from said removed prepared frozen foods of step (c) and placing said repackaged foods of step (d) in a freezing zone;

f. said process additionally including re-using said compartmentalized zone of step (c) for placing of additional prepared foods for freezing; and

g. said process additionally including removing said repackaged food from said freezing zone, and heating said removed repackaged foods for human consumption.

3,911,157

PROCESS FOR PREPARING TEXTURIZED VEGETABLE PROTEIN

Norman Andrew Bates, Wyoming, and Robert Earl Tarr, Forest Park, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 13, 1974, Ser. No. 523,649
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—459 10 Claims

1. A process for preparing a meat-like protein product from vegetable protein which comprises the steps of forming a coherent proteinaceous dough comprising from 40% to 90% by weight of a vegetable protein material having a protein content of from 30% to 60% by weight and from 10% to 60% water; roll milling the proteinaceous dough to a thickness of 18 mils or less, thereby to disrupt the cellular structure of the vegetable protein material and provide a content of exposed and coagulable protein; and cooking the roll-milled dough by heating at from 180°F to 300°F in the presence of a non-drying atmosphere of moist steam.

3,911,158

CHEESE FLAVORING

Michel John Arthur Groux, Lauperswil, and Miche Moinas, La Tour-de-Peilz, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Oct. 15, 1974, Ser. No. 514,400
Claims priority, application Switzerland, Oct. 22, 1973, 14885/73
Int. Cl.[2] A23L *1/226*
U.S. Cl. 426—534 3 Claims

1. A flavouring composition for providing food products with a cheese flavour of the goat's milk cheese type, containing at least the following substances, whose quantities are expressed in parts by weight:

butanone + 2-pentanone	30 to 40

the butanone representing at least 30 % and at most 50 % by weight of these two ketones,

2-heptanone	4 to 8
2-nonanone	1.5 to 2.5
caproic acid	40 to 60

distinguished by the fact that it contains, in combination with the aforementioned substances, from 5 to 9 parts by weight of n-heptanal and from 2 to 7 parts by weight of methyl caproate and ethyl caprate, the ethyl caprate representing at least 20 % and at most 50 % by weight of the two esters.

3,911,159

PROTEIN FIBER FORMING

Wilhelmus Heusdens, Kirkwood, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation of Ser. No. 98,009, Dec. 14, 1970, abandoned.
This application Nov. 5, 1973, Ser. No. 413,016
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—580 15 Claims

1. A method of continuously forming discrete elongated tender protein filaments from proteinaceous material comprising:

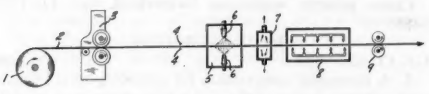
a. forming a pumpable slurry of a mixture of a protein containing material and an added material selected from the group consisting of cellulose and carbohydrate by-products from the processing of protein containing vegetable materials and grains; the slurry having a solids content of above about 20% by weight and a protein content of above about 40% by weight on a dry basis,

b. hydrating the proteinaceous material in the slurry to place the proteinaceous material in a sufficiently reactive form to produce elongated protein filaments,
c. forming discrete elongated protein filaments by continuously conducting the proteinaceous slurry under pressure through a heat exchange zone and heating the slurry to a temperature which is less than that which will degrade the protein, while the protein is subjected to such temperature for a sufficient period of time so that elongated tender filaments are separated from the remaining constituents of the slurry, continuously removing the heated slurry from said zone through a back pressure creating orifice and discharging the formed discrete elongated filaments and remaining constituents of the slurry into a collecting zone, and
d. in said collecting zone separating the tender elongated protein filaments from the remaining constituents of the slurry and recovering said discrete filaments.

3,911,160
METHOD OF USING RESIN POWDERS TO CURE SOLVENT-FREE INKS

William B. Neuberg, Garden City, N.Y., assignor to Shamrock Chemicals Corporation, New York, N.Y.

Filed Mar. 19, 1974, Ser. No. 452,512
Int. Cl. B41m *1/00*; **B05b** *5/02*
U.S. Cl. 427—27 **11 Claims**

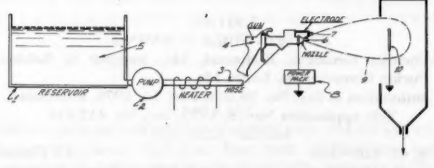


1. In a printing process comprising the step of applying a solvent-free oil or liquid ink to a surface, the improvement comprising:
a. applying a powder resin having an average particle size between about 5–10 microns to the inked surface; and
b. curing the resinated ink to provide a non-raised printed surface with a thickness below about 7 microns.

3,911,161
ELECTROSTATIC SPRAY-COATING WITH HOT MELT COMPOSITIONS

Eric T. Nord, Oberlin, and Don R. Scarbrough, Elyria, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Oct. 2, 1972, Ser. No. 291,818
Int. Cl.² B05D *1/04*
U.S. Cl. 427—30 **11 Claims**



1. A method of spray-coating an article which comprises,
heating a melt composition to a temperature based upon its softening point to provide a heated liquid mass,
providing an article to be coated,
atomizing said heated liquid mass to form atomized particles,
conducting said atomization in the presence of an electrostatic field,
cooling said particles in the presence of said field,
electrostatically transferring said particles to and depositing them on said article,
said transferring being over a distance such that based on said temperature, a substantial number of said atomized particles solidify to a non-tacky state in route to said article, and.
recovering an amount of oversprayed atomized solid particles and recycling said oversprayed solid particles for inclusion in the heated melt composition.

3,911,162
SYSTEM FOR VAPOR DEPOSITION OF THIN FILMS

Francis J. Erhart, Webster, and Harold H. Schroeder, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

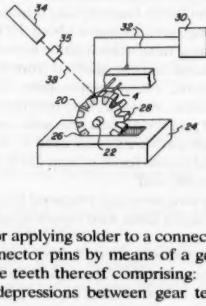
Continuation-in-part of Ser. No. 244,374, April 17, 1972, abandoned. This application Nov. 23, 1973, Ser. No. 418,510
Int. Cl.² C23C *11/00*
U.S. Cl. 427—39 **9 Claims**

1. A method of vapor depositing a substantially uniform thin film of photoconductive material on a substrate body comprising the steps of:
positioning a plurality of substrate bodies on a plurality of elongated, horizontally extending cylindrical support mandrels;
rotating each of said mandrels about an associated longitudinal axis thereof and simultaneously transporting said plurality of mandrels in an annular path about a horizontal axis;
establishing an evacuated atmosphere about said mandrels; and
vaporizing a suitable photoconductor material, which is positioned in a planar array of crucibles located within the annular path of travel of said mandrels, with at least one additional crucible being positioned in an outrigger configuration at each corner of the planar array, said crucible array extending substantially coextensively along the entire length of the plurality of substate bodies.

3,911,163
SOLDER COATING PROCESS AND APPARATUS

Dennis L. Wilson, Mission Viejo, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1973, Ser. No. 428,652
Int. Cl.² C23C *1/00*
U.S. Cl. 427—46 **8 Claims**



1. A method for applying solder to a connector having a row of electrical connector pins by means of a gear with depressions between the teeth thereof comprising:
a. filling the depressions between gear teeth with solder paste,
b. locating one pin of said row of pins such that said one pin extends into one of said depressions,
c. relatively moving said depressions and pins such that successive depressions and pins are contacted,
d. applying heat to said pins substantially at the time of contact with said solder paste within said depressions.

3,911,164
NOVEL COMPOUNDS AND PROCESS

Adnan A. R. Sayigh; Fred A. Stuber, both of North Haven, and Henri Ulrich, Northford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

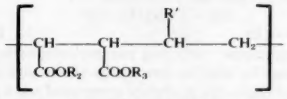
Continuation-in-part of Ser. No. 93,446, Nov. 27, 1970, Pat. No. 3,784,527, which is a continuation-in-part of Ser. No. 15,852, March 2, 1970, abandoned. This application Sept. 14, 1973, Ser. No. 397,237The portion of the term of this patent subsequent to Jan. 8, 1991, has been disclaimed.

Int. Cl.[2] **B05D** *3/06;* **C08J** *7/04, 7/10*

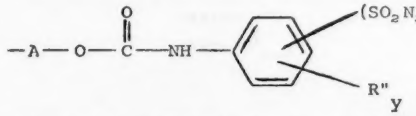
U.S. Cl. 427—53 **6 Claims**

1. A process for rendering hydrophilic the surface of a substrate which is normally hydrophobic which process comprises:

a. coating the said substrate with a radiation sensitive polymer characterized by the recurring unit:



wherein R′ is selected from the class consisting of lower-alkoxy and phenyl and wherein one of R_2 and R_3 represents hydrogen and the other of R_2 and R_3 represents a group having the formula:



wherein A is alkylene having from 2 to 6 carbon atoms separating the valencies and a total carbon atom content of from 2 to 10, R″ is selected from the class consisting of lower-alkyl and halogen, x is an integer from 1 to 2, y is an integer from 0 to 2, provided that $x + y$ is not greater than 3, and the SO_2N_3 group is in any of positions 3, 4, and 5 in the phenyl nucleus to which it is attached, and at least one of the said positions 3, 4, and 5 is unsubstituted; and

b. exposing the coated substrate to appropriate radiation to activate said light and heatsensitive polymer.

3,911,165
METHOD OF FABRICATING SECONDARY ELECTRON EMISSION PREVENTIVE FILM AND COLOUR PICTURE TUBE HAVING SAME

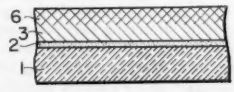
Hiromi Kanai, Mobara, and Eiichi Yamazaki, Ichihara, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 31, 1973, Ser. No. 411,193

Claims priority, application Japan, Dec. 4, 1972, 47-120650

Int. Cl.[2] **B44D** *1/02*

U.S. Cl. 427—68 **3 Claims**



1. A method of fabricating a secondary electron emission preventive film for use in a colour picture tube comprising the steps of applying a fluorescent screen on a face plate, forming a deposited layer as a metal back layer on the fluorescent screen, spraying an aqueous suspension of one material from the group consisting of carbon, boron and a compound thereof onto said metal back layer, and heating the face plate to form a mixed layer of said one material and the metal back layer material on an upper portion of the metal back layer.

3,911,166
METHOD OF TREATING GLASS HEADER CAPACITORS TO REDUCE LEAKAGE CURRENTS

John E. Bailey, Needham, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Jan. 30, 1974, Ser. No. 437,813

Int. Cl.[2] **C03C** *17/00;* **B05D** *5/12*

U.S. Cl. 427—79 **4 Claims**

1. A method for reducing the current leakage of metal-glass header capacitors in high humidity environments by a silicone treatment without adversely affecting the capacitor's normal physical and electrical characteristics comprising the steps of exposing the glass header, while in a virgin uncontaminated state, to a metal-noncorrosive solution of a solvent and an alkyl-alkoxysilane capable of being cured through evaporative drying of the solvent without the application of heat and then drying the glass header at a temperature below that at which the capacitor's electrical characteristics would be adversely affected.

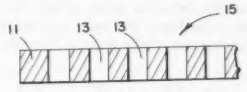
3,911,167
ELECTRON MULTIPLIER AND METHOD OF MAKING SAME

Jacques F. Linder, Palos Verdes Peninsula, Calif., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 33,830, May 1, 1970, abandoned. This application Apr. 19, 1974, Ser. No. 462,466

Int. Cl.[2] **H01L** *23/34*

U.S. Cl. 427—87 **4 Claims**



1. A method of forming dynode plates comprising:

a. providing a plate of insulating material having a plurality of holes therethrough,

b. selecting a glazing composition comprised of a lead glass having 30–60 mole percent lead oxide, about 6 mole percent bismuth trioxide, about 9 mole percent silicon dioxide, and 30 mole percent boron trioxide,

c. adding liquid to said glazing composition to obtain a suspension between 1.0 and 1.30,

d. dipping said plate in said suspension to coat at least the inside of the holes therethrough with said glazing composition,

e. drying said glazing composition at ambient temperature,

f. heating said plate with the dried glazing composition thereon at a temperature of 500° to 550° C to fuse said glazing composition into a glaze, and

g. heating said plate with said glazed composition thereon at a temperature of 325° to 350° C in a reducing atmosphere to provide a semiconductive layer on said glazed composition.

3,911,168
METHOD FOR FORMING A CONTINUOUS LAYER OF SILICON DIOXIDE OVER A SUBSTRATE

Richard D. Schinella, Mountain View, and Michael P. Anthony, San Carlos, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed June 1, 1973, Ser. No. 365,882

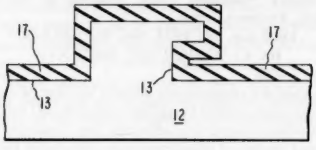
Int. Cl.[2] **B44D** *1/14*

U.S. Cl. 427—93 **5 Claims**

1. A method for forming a continuous layer of silicon dioxide on all portions of an irregular substrate surface comprising the sequential steps of:

forming a layer of polycrystalline silicon upon said surface of said substrate; and

completely converting all of said layer of polycrystalline silicon to silicon dioxide by the steps of:



applying an oxidizing agent; and

providing thermal energy to said substrate for a sufficient period of time to effect the oxidation of said layer of polycrystalline silicon.

3,911,169

PROCESS FOR IMPROVING THE ADHESION OF COATING MADE OF PHOTORESISTANT POLYMERS TO SURFACES OF INORGANIC OXIDES

André Lesaicherre, Lesigny, and Louis Linguenheld, St. Genis Laval, both of France, assignors to Rhone-Poulenc S.A., Paris, France

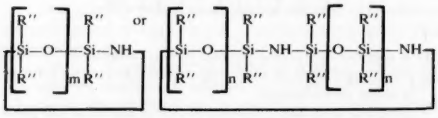
Filed July 30, 1973, Ser. No. 383,507

Claims priority, application France, July 31, 1972, 72.27581; May 7, 1973, 73.16286

Int. Cl.[2] B44D *1/092*

U.S. Cl. 427—96 **6 Claims**

1. A process for bonding a photoresistant polymer to a layer of inorganic oxides, wherein prior to the deposition of the polymer on the oxide layer, the layer is treated with a cyclopolysiloxazane of the general formula:



in which formulae each R'', which may be identical or different, represents a methyl or phenyl radical, at least 40% of these radicals being methyl radicals; *m* represents an integer of 2 to 5 and the symbols *n*, which are identical, each is 1 or 2.

3,911,170

METHOD OF PROCESSING POROUS MATERIALS

Satoru Honjo, and Masaaki Takimoto, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 11, 1973, Ser. No. 368,789

Claims priority, application Japan, June 9, 1972, 47-57398

Int. Cl.[2] B32B *35/00, 29/00*

U.S. Cl. 427—140 **16 Claims**

1. A method for processing a porous paper coated with a layer of a surface coating of a film-forming resin to reduce or remove pinholes which permit the penetration of a liquid and which exist in the surface coating of a film-forming resin which is capable of nearly preventing penetration of a liquid to the porous material; which method comprises bringing said layer of surface-coating resin into contact with a pinhole-filling dispersion comprising a liquid and a finely dispersed substance selected from the group consisting of a colorless pigment, a plastic particle or a pigment coated with a plastic therein, said liquid easily penetrating into the interior of the porous paper through pinholes formed in said surface-coating resin and carrying said finely dispersed substance into said pinholes, whereby said finely dispersed substance fills and seals said pinholes and wherein the rate of penetration of said pinhole-filling dispersion is from about 2×10^{-4}mm^3 to about 60×10^{-4}mm^3/sec.

3,911,171

THERMOGRAPHIC RECORDING PROCESS

Wilhelmus Janssens, Aarschot; Daniel Alois Claeys; Raymond Gerard Lemahieu, both of Mortsel, and Jozef Aime Dierckx, Hove, all of Belgium, assignors to Agfa-Gevaert, a naamloze vennootschap, Mortsel, Belgium

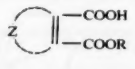
Filed Dec. 27, 1973, Ser. No. 428,781

Claims priority, application United Kingdom, Sept. 14, 1973, 43336/73; Nov. 30, 1973, 55687/73

Int. Cl.[2] B41M *5/18*

U.S. Cl. 427—145 **13 Claims**

1. A thermographic recording process comprising producing a dye image by bringing into image-wise reactive contact with the aid of heat a dye precursor compound and a generally non-crystallizing compound with acid reaction corresponding to the following general formula:



wherein:

Z represents the necessary atoms to close an unsubstituted benzene nucleus, a halogen-substituted benzene nucleus or a nitro-substituted benzene nucleus, and

R represents an unsubstituted aliphatic group containing at least 4 carbon atoms, a cycloaliphatic group or an aliphatic group substituted with hydroxyl, with an etherified hydroxyl group or with an acyloxy group.

3,911,172

ADHESION OF HYDROPHILIC LAYERS ON POLYESTER FILM

August Jean Van Paesschen, Antwerp; Lucien Janbaptist Van Gossum, Kontich, and Jan Jozef Priem, Mortsel, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed May 24, 1973, Ser. No. 363,390

Claims priority, application United Kingdom, May 26, 1972, 25069/72

Int. Cl.[2] G08B *15/00;* **G03C** *1/84, 1/78*

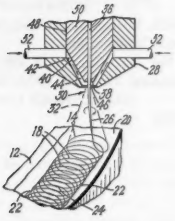
U.S. Cl. 427—171 **10 Claims**

1. Process for improving the adhesion of hydrophilic layers on a dimensionally stable polyester film support, which comprises longitudinally stretching said polyester film, applying after longitudinal stretching of the polyester film support a single adhesive layer thereto, stretching the thus covered polyester film support in a transverse direction, and heat-setting it at 180°–220°C, said adhesive layer comprising 30 to 80% by weight of a chlorine-containing copolymer 5 to 30% by weight of gelatin, 4 to 40% by weight of a plasticizer for said gelatin, and from about 8% to about 30% by weight of a sulphosalicylic acid salt as a metal-complexing antistatic agent, said chlorine-containing copolymer comprising about 70 to 95% by weight of viny choride and/or vinylidene chloride, about 0.5 to 10% by weight of a hydrophilic monomer, and about 0.5 to 25% by weight of at least one other copolymerizable monomer.

3,911,173
ADHESIVE PROCESS

Gordon V. Sprague, Jr., Danvers, Mass., assignor to USM Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 329,362, Feb. 5, 1973, abandoned. This application Nov. 19, 1973, Ser. No. 417,352
Int. Cl.[2] B05D 7/12
U.S. Cl. 427—207 7 Claims



1. The process of applying adhesive to the surface comprising the steps of extruding viscous fluid adhesive as a filament into a gaseous jet from a point spaced from said surface, said jet having one component of movement in the direction of said attaching surface acting on said filament to attenuate it into a thin filament and a rotational component about an axis corresponding to the direction of said one component acting to guide the filament in a circular path progressively increasing in diameter as it moves away from said point to gererate a substantially conical envelope and to deposit loops of said adhesive filament on said surface while the filament is still soft and adhesive, and moving said surface ralative to said point whereby successive loops of said adhesive filament are deposited on said surface as a band of overlapping loops.

3,911,174
METHOD OF COATING FLEXIBLE SHEET MATERIAL

Robert Charles Rose, Atlanta, Ga., assignor to Anglo-American Clays Corporation, Atlanta, Ga.

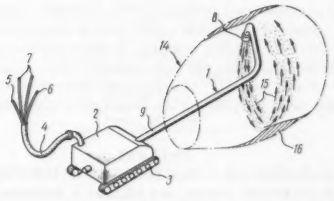
Filed May 16, 1974, Ser. No. 470,689
Int. Cl.[2] B05D 1/00, 5/00, 3/12
U.S. Cl. 427—211 12 Claims

1. A method of applying a high solids coating to a traveling web of flexible sheet material which includes the steps of applying a high solids coating to the web in a quantity in excess of the amount desired to be coated thereon, positioning a wiping roll to engage and wipe and smooth the coating thus applied to the traveling web, rotating the wiping roll in a direction and at a surface speed of rotation sufficient to create a negative hydrodynamic pressure at the nip of engagement of the wiping roll with the coating applied to the traveling web, cleaning the surface of the wiping roll so that it continually presents a clean surface at the nip of engagement of the wiping roll with the coating applied to the traveling web, and drying the coated web.

3,911,175
METHOD AND A DEVICE FOR GUNNITING CONVERTER

Oleg Nikolaevich Chemeris, bulvar Mira, 18, kv. 69; Evgeny Vasilievich Tretyakov, ulitsa Rozy Ljuxemburg, 30, kv. 32; Viktor Kirillovich Didkovsky, ulitsa Rozy Ljuxemburg, 30a, kv. 42; Vilen Davidovich Kanfer, ulitsa Tsusimskaya, 63, kv. 17, all of Donetsk; Nikolai Konstantinovich Paschenko, ulitsa Makara Mazaya, 74, kv. 1, Zhdanov Donetskoi oblasti; Izmail Grigorievich Zeltser, prospekt Nakhimova, 154, kv. 29, Zhdanov Donetskoi oblasti; Girgory Mikhailovich Ljukimson, prospekt Lenina, 45, kv. 10, Zhdanov Donetskoi oblasti; Alexandr Nikolaevich Bashkatov, poselok Ukraina, pereulok Sadkovy, 70, 72, Zhdanov Donetskoi oblasti; Boris Nikolaevich Melnikov, ulitsa Sechenova, 68, kv. 27, Zhdanov Donetskoi oblasti; Miron Yakovlevich Medzhibozhsky, pereulok Nakhimova, 5, kv. 26, Zhdanov Donetskoi oblasti; Ilya Alexandrovich Goldberg, ulitsa Shaumiana, 47, kv. 35, Leningrad; Izrail Abramovich Juzefovsky, ulitsa Reshetova, 5, kv. 55, Leningrad; Rafail Davidovich Ratmansky, ulitsa Ilicha, 52, kv. 53, Zhdanov Donetskoi oblasti; Viktor Nikolaevich Irkha, ulitsa Sechenova, 68, kv. 48, Zhdanov Donetskoi oblasti; Jury Nikolaevich Borisov, prospekt Sovetskoi Armii, 16, kv. 13, Novokuznetsk Kemerovskoi oblasti, and Fedor Filippovich Kurochkin, prospekt Nakhimova, 154, kv. 33, Zhdanov Donetskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 221,655, Jan. 28, 1972, abandoned. This application July 3, 1974, Ser. No. 485,598
Int. Cl.[2] B05B 7/20
U.S. Cl. 427—233 1 Claim



1. A method of flame spraying gunnite on the interior cylindrical surface of a converter, said method comprising the steps of:

A. providing an interior cylindrical working surface of a converter;

B. dusting a flame with a pulverized refractory to provide a plastified material to be coated onto the interior cylindrical working surface;

C. imparting to the flame containing the plastified material a rotational movement relative to the longitudinal axis of the cylindrical surface of the converter after the flame has been dusted with the pulverized refractory; and

D. directing the flame tangentially with the plastified material entrained therein to the interior cylindrical working surface of the converter by controlling the relative rotation between the cylindrical working surface of the converter and the angle of the flame substantially tangent thereto and continuously flame spraying gunnite in a path of rotating gases so that the plastified material adheres to the cylindrical surface and portions of the material which rebound from the cylindrical working surface are driven back onto the cylindrical surface under centrifugal forces of the flue gases of the flame.

3,911,176
METHOD FOR VAPOR-PHASE GROWTH OF THIN FILMS OF LITHIUM NIOBATE

Bernard John Curtis, Gattikon, and Hans Rudolf Brunner, Niedersteinmaur, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,211
Int. Cl.[2] C23C *11/08*
U.S. Cl. 427—248 **15 Claims**

1. A process of depositing a film of lithium niobate on a substrate, said substrate being thermally stable up to about 1,000°C, which comprises:

a. vaporizing a lithium compound having a vapor pressure greater than 1 millimeter at a temperature of less than 500°C and a stable gas phase up to 400°C,

b. vaporizing a niobium compound having a vapor pressure greater than 1 millimeter at a temperature of less than 500°C and a stable gas phase up to 400°C, and

c. contacting said substrate with the vapor of said lithium compound and the vapor of said niobium compound in an oxidizing atmosphere at a temperature of at least about 400°C.

3,911,177
PROCESS FOR PREPARING STEEL FOR ENAMELING

Maurice Humbert, Plainevaux, and Dominique Streel, Sclessin-Ougree, both of Belgium, assignors to Cockerill-Ougree-Providence et Esperance-Longdoz en Abrege "Cockerill", Liege, Belgium

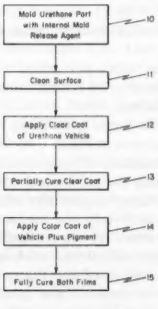
Filed May 15, 1973, Ser. No. 360,608
Int. Cl.[2] C23C *13/02*; **B32B** *15/04*
U.S. Cl. 427—250 **7 Claims**

1. A process for preparing steel sheet and strip for the direct application of white enamel thereto without a prime coat, which consists in degreasing and rinsing steel sheet or strip having less than 0.012% by weight carbon, heating said rinsed steel at a temperature between 200°C. to 800°C., and depositing by vacuum evaporation on the steel a binary alloy of iron and a member selected from the group consisting of nickel and cobalt, said alloy having a content from 1 to 15% by weight of said member, balance essentially iron, thereby to avoid the need for pickling the steel before enameling.

3,911,178
PAINTING OF A MOLDED URETHANE PART

Floyd E. McDowell, Exeter, and Michael J. Williams, Somersworth, both of N.H., assignors to McCord Corporation, Detroit, Mich.

Filed Feb. 19, 1974, Ser. No. 443,319
Int. Cl.[2] B32B *27/40*; **B05D** *1/38*
U.S. Cl. 427—316 **4 Claims**



1. In the painting with a paint of a molded urethane part made from a moldable urethane formulation containing a wax of a type and in an amount sufficient to serve as a mold release agent, said paint comprising a urethane lacquer vehicle with a pigment dispersed therein, the improvement comprising:

A. cleaning a surface of said part to at least in part remove said wax therefrom:

B. applying a clear continuous barrier coat to said surface of said vehicle free of pigment as a film having a thickness under 0.5 mil, dry;

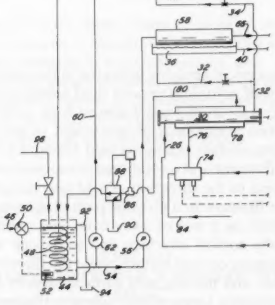
C at least partially curing said barrier coat by heating to a film temperature in the range of 180°–260°F, and

D. applying said paint as a film and curing said film by baking at a film temperature in excess of 225°F.

3,911,179
METHOD OF APPLYING STARCH ADHESIVE BONDING AGENT

Walter J. Goettsch, Wilmette, Ill., assignor to Molins Machine Company, Inc., Camden, N.J.

Division of Ser. No. 268,403, July 3, 1972, Pat. No. 3,827,395.
This application Mar. 20, 1974, Ser. No. 452,876
Int. Cl.[2] B44D *1/44*
U.S. Cl. 427—361 **5 Claims**

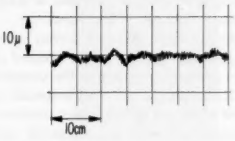


1. A method for applying a starch adhesive bonding agent to a component of a moving web of corrugated paperboard comprising providing a housing containing a supply of the bonding agent and an applicator roll associated therewith for applying the bonding agent to said component, circulating the bonding agent at a rate of flow in excess of 25 gallons per minute from a tank through said housing and back to said tank at a uniform temperature about 15°–20° F. below the gelatinization temperature of the bonding agent, maintaining the temperature of the circulating bonding agent stable at said uniform temperature by means of a heat exchanger between said tank and housing, heating said applicator roll so that it will increase the temperature of the bonding agent on the surface thereof from said uniform temperature to a temperature about 2°F. below the gelatinization temperature of the starch adhesive bonding agent, and applying said bonding agent to said web by said applicator roll.

3,911,180
METHOD OF MAKING A RESIN COATED PAPER HAVING A SMOOTH SURFACE

Tomoaki Ozaki; Nobuhiko Minagawa, both of Fujimiya, and Kazunobu Kato, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 13, 1972, Ser. No. 297,558
Claims priority, application Japan, Oct. 15, 1971, 46-81377
Int. Cl.[2] B44D *1/44*
U.S. Cl. 427—362 4 Claims



1. A method of making resin coated paper having a surface of good smoothness which comprises forming a thermoplastic resin layer on the paper and pressing the thus resin coated paper between two or more heated metal rolls, in which the surface temperature of the rolls is kept at 30°C–150°C and the pressure between the rolls is kept at 50 kg/cm-350 kg/cm.

3,911,181
PERMANENT PRESS TEXTILE FINISH

William Frank Herbes, Bridgewater Township, Somerset County, N.J., and Robert George Weyker, Memphis, Tenn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 124,910, March 16, 1971, abandoned, which is a continuation of Ser. No. 763,344, Sept. 27, 1968, abandoned. This application Apr. 16, 1973, Ser. No. 351,395
Int. Cl.[2] D06M *15/12*
U.S. Cl. 427—390 7 Claims

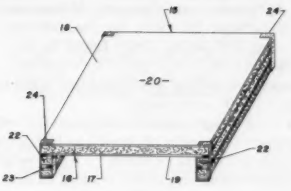
1. A method for providing a crease resistance to cellulosic-containing textile materials which comprises applying from about 2 to 20%, based on the weight of said textile materials of an aminoplast finish comprising an aqueous solution of a mixture of 1,3-dimethylol-4,5-dihydroxyethyleneurea and a urea-formaldehyde condensate, said urea-formaldehyde condensate being from 5 to 50% by weight of the total aminoplast and said 1,3-dimethylol-4,5-dihydroxyethyleneurea being from 50 to 95% of the total aminoplast, said urea-formaldehyde condensate further containing from 1.8 to 3.6 mols of combined formaldehyde, thereafter drying said textile material and curing said finish on said textile at an elevated temperature, in the presence of an acid acting catalyst.

3,911,182
LOAD-SUPPORTING PALLETS

Abraham Buddy Lieberman, 4755 Boulevard des Grandes Prairies, St. Leonard, Montreal 457, Quebec, Canada

Filed Jan. 25, 1974, Ser. No. 436,715
Int. Cl.[2] B65D *19/00, 19/18*
U.S. Cl. 428—12 8 Claims

1. A load-supporting pallet formed of a laminated material and comprising a flat, expansible platform having a core made from a polyurethane material, top and bottom facings formed of flexible material adherently attached to the top and bottom surfaces of said core, a series of foldable sections forming an integral part of said flat, expansible platform and formed by longitudinally slitting and creasing certain portions of said facings and core of said platform and located adjacent to at least two of its opposing sides, whereby in operation said foldable sections are adapted to be folded over one another to complete and erect spaced laminated parallel runners beneath

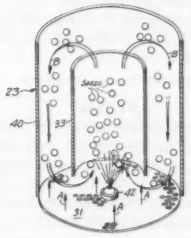


said flat, expansible platform and abutting the underside thereof.

3,911,183
SEED COATING PROCESS AND PRODUCT

Thomas M. Hinkes, 5414 Dorsett Drive, Madison, Wis. 53711

Filed Nov. 10, 1972, Ser. No. 305,485
Int. Cl.[2] A01C *1/06*
U.S. Cl. 428—15 12 Claims



1. A coated seed of a plant having an essentially established growth rate and comprising a polymeric/systemic-pesticide film encapsulating the seed, the film comprising a polymer matrix throughout which the pesticide is substantially uniformly distributed in an effective amount no higher than that permitted by U.S.D.A. regulations, the polymer being a halogenated vinyl resin capable of permitting releases of said pesticide at a predetermined rate conforming to the growth rate of the plant and the seed being cotton seed.

3,911,184
PLASTIC OXYGEN BARRIERS

Terry L. Caskey, Concord, and Robert O. Lindblom, Walnut Creek, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 816,806, April 16, 1969, abandoned. This application Apr. 1, 1971, Ser. No. 130,544
Int. Cl.[2] B05B *5/02;* B44D *1/092*
U.S. Cl. 428—35 16 Claims

1. An enclosure member substantially impermeable to the transmission of gases comprising a solid sulfonatable aromatic polymer having a plurality of free hydrogen atoms attached to the carbon atoms thereof, said member having an inner and outer surface, at least one of said surfaces having a portion of the hydrogen atoms thereof replaced by an amount of polyamine sulfonate salt groups sufficient to give improved gas barrier properties to said member.

3,911,185

HIGH RING AND BALL SOFTENING POINT HOT MELT BACKSIZE ADHESIVE COMPOSITION

Kenneth Yerxa Wright, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 26, 1974, Ser. No. 509,563
Int. Cl.[2] D03D *27/00;* **D04H** *11/00*
U.S. Cl. 428—97 **14 Claims**

1. A composition having a ring and ball softening point of at least about 230°F. comprising

A. about 4–25 weight percent ethylene/vinyl ester copolymer having a melt index of about 2 to 150, a copolymerizable ethylene content of about 72 to 82 weight percent, a copolymerizable vinyl ester content of about 18 to 28 weight percent, wherein the acid moiety of said vinyl ester contains 1 to 4 carbon atoms,

B. about 0.7–5 weight percent of an ethylene homopolymer having a molecular weight of about 1,500–3,000, a density of about 0.94–0.97 g./cm.[3] and a melting point of about 240°F.–270°F.,

C. about 10–15 weight percent of a polymer resin derived from the alkylation of aromatic compounds with dicyclopentadiene and having a softening point of about 40°F.–105°F.,

D. about 10–15 weight percent of an aliphatic thermoplastic hydrocarbon resin substantially free of polymerized aromatics prepared from diene and olefin monomers of 5 to 7 carbon atoms and having a softening point of about 155°F.–240°F.,

E. about 0.5–8 weight percent of a paraffin wax, and

F. about 25–75 weight percent filler.

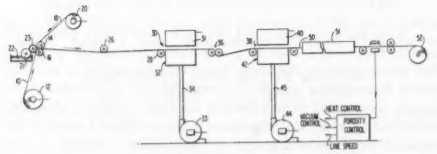
9. the composition of claim **4** wherein resin (D) has a softening point of about 215°F.–240°F. and resin (C) has a softening point of about 55°F.–90°F.

3,911,186

PERFORATE COMPOSITE AND CONTINUOUS-STRIP MANUFACTURING METHODS AND APPARATUS

Herbert H. Trotman, c/o Comfort Conditioning, Inc. P.O. Box 1046, Virginia Beach, Va. 23451

Filed Jan. 12, 1973, Ser. No. 323,326
Int. Cl.[2] B32B *15/02*
U.S. Cl. 428—137 **35 Claims**



1. Continuous-line process for manufacturing a perforate composite from non-perforate solidified plastic sheet material and perforate substrate while controllably producing porosity in the composite, comprising the steps of

providing an elongated perforate continuous-length woven substrate with defined interstices,

directing such substrate longitudinally along a continuous-processing line,

providing an elongated continuous-length plastic sheet material in solidified non-perforate film form of substantially uniform thickness,

directing such plastic sheet material longitudinally along the continuous process line,

continuously feeding the substrate and plastic sheet material longitudinally into aligned contiguous relationship while each is traveling along the continuous processing line at substantially the same longitudinal speed,

applying such plastic sheet material to overlay substantially entirely one surface of the elongated substrate forming a non-perforate composite in such area of overlay,

heating the plastic sheet material after contact with the substrate while applying a vacuum to the remaining surface of the substrate by directing such composite longitudinally over vacuum means while traveling along the continuous processing line,

controlling longitudinal speed of travel of such composite over such vacuum means while controlling such heating to produce thermoplasticity in the plastic sheet material, controlling the vacuum applied through such vacuum means to draw such heated plastic sheet material into interstices of the sustrate and stretch the heated plastic sheet material within such interstices toward such remaining surface so as to coat portions of such interstices between opposed surfaces of the substrate,

rupturing the plastic sheet material within such interstices by flow of a gaseous medium under control of such vacuum means to produce porosity in the composite distributed over such area of plastic sheet material overlay, with portions of the ruptured plastic sheet material extending to the remaining surface of the substrate and wrapping around portions of such subsurface to mechanically interlock the plastic sheet material and the substrate.

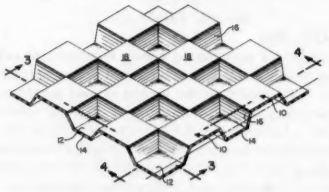
27. The article of claim **26** in which the solidified plastic film is selected from the group consisting of polyurethane, polyethylene, polypropylene, polyvinyl chloride, blends of polyvinyl chloride and copolymers made from acrylonitrile, butadiene, and styrene, blends of polyvinyl chloride and rubber, and polystyrene.

3,911,187

EMBOSSED PLASTIC FILM

Garland E. Raley, Terre Haute, Ind., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 26, 1973, Ser. No. 428,186
Int. Cl.[2] B32B *1/00, 3/30*
U.S. Cl. 428—180 **2 Claims**

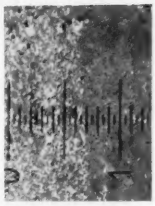


1. An embossed length of thermoplastic polyolefin film having a pattern of latitudinally and longitudinally alternating, hollow protuberances and depressions on each side of said film wherein: (a) each of said protuberances and depressions have four substantially identical sidewalls, (b) each of said protuberances has a top wall, (c) each of said depressions has a bottom wall, (d) a first edge of each of said sidewalls of said protuberances is planarly connected to a bottom wall of a depression, and a second edge of each of said sidewalls opposite said first edge is connected to a top wall of a protuberance, (e) a third edge of each of said sidewalls, and a fourth edge of each sidewall opposite said third edge are each planarly connected to adjacent sidewalls, (f) the opposite side of each hollow protuberance forms one of the depressions on the film side opposite the protuberance, (g) said protuberances are substantially in the shape of four-sided, truncated pyramids, (h) said sidewalls of said protuberances and said depressions form an angle with the bottom wall of said depression from about 45° to about 85°, and (i) said protuberances have a height of from about 0.5 mils to about 10 mils.

3,911,188
HIGH STRENGTH COMPOSITE CERAMIC STRUCTURE

Maurice L. Torti, Jr., Boston, and David W. Richerson, Auburn, both of Mass., assignors to Norton Company, Worcester, Mass.

Filed July 9, 1973, Ser. No. 377,547
Int. Cl.[2] C04B *35/56, 35/58*
U.S. Cl. 428—218 **7 Claims**



2.85 MICRONS PER DIVISION

1. A hot pressed Si_3N_4 composite body having its outer layers locked into a state of compressive stress, said body comprising surface layers of Si_3N_4 having a predetermined coefficient of thermal expansion and an internal layer comprising a mixture of Si_3N_4 and a second ceramic compound which provides a coefficient of thermal expansion for said mixture which is greater than said predetermined coefficient of thermal expansion, said internal layer being intimately bonded to the outer layers by a continuous phase of said Si_3N_4, the area ratio of the outer layers to the internal layer being sufficiently large and the coefficient of thermal expansion of the internal layer being sufficiently greater than the coefficient of the outer layers that, with a hot pressing temperature of about 1,700°C, the compressive stress at room temperature in the outer layers is at least 15,000 p.s.i.

3,911,189
FLAMEPROOFING OF FABRICS

George T. Miller, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed May 18, 1973, Ser. No. 361,706
Int. Cl.[2] C09K *3/28*
U.S. Cl. 428—272 **13 Claims**

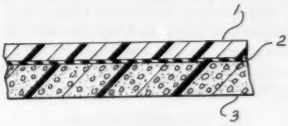
1. A flameproof synthetic fibrous material comprising a normally flammable synthetic material selected from the group consisting of poly(hexamethyleneadipamide), polycaproamide, and poly(m-phenyleneisophthalamide), which material contains a flame retardant amount of the reaction product of an aqueous solution of orthophosphoric acid containing from about 1 to about 85% by weight orthophosphoric acid and at least one alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide and butylene oxide, the weight ratio of alkylene oxide to H_3PO_4 in said reaction product being 0.5–1.5:1.

3,911,190
COMPOSITE CONSTRUCTION

Robert A. Myers, and A. Russell Hoge, both of Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 23, 1974, Ser. No. 535,650
Int. Cl.[2] B32B *3/26*
U.S. Cl. 428—315 **10 Claims**

1. A composite structure comprising (1) a sheet of thermoplastic material which is bonded to; (2) a rubber modified high nitrile polymer which in turn is bonded to; (3) a layer of a gas filled cellular insulation material wherein a major amount of the cells in the insulation material are filled with a halogenated aliphatic or cycloaliphatic hydrocarbon, and wherein the rubber-modified high nitrile polymer contains from 55 to 85 percent by weight, based on the total polymer

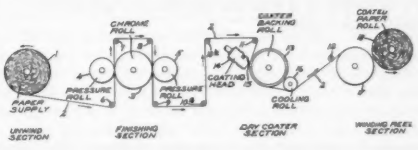


weight, of a nitrile monomer unit and from 5 to 30 percent by weight of a synthetic or natural rubber component.

3,911,191
COATED PAPER PRODUCTS

Samuel L. Guastella, Westminster, Mass., and Jerry J. Larrivee, Jr., Gorham, Maine, assignors to Blandin Paper Company, Grand Rapids, Minn.

Continuation of Ser. No. 1,995, Jan. 12, 1970, Pat. No. 3,723,169, which is a continuation-in-part of Ser. No. 866,766, Oct. 15, 1969, abandoned. This application Sept. 14, 1972, Ser. No. 289,013
Int. Cl.[2] B05D *3/12;* **B32B** *23/08, 27/10*
U.S. Cl. 428—342 **9 Claims**



1. Coated paper that is ink-receptive and has good printing properties which comprises a paper web which has been extrusion coated with a rigid coating blade, on at least one side, with a molten hot melt coating composition, said molten hot melt coating composition consisting essentially of at least 50 percent by weight of a coating pigment or mixture of coating pigments dispersed in a diluent-free, heat extrudable binder or mixture of binders, said heat extrudable binder having an ASTM melt index of about 30–400, said molten hot melt coating composition having a total coating weight of 3–15 grams per square meter of said paper web.

3,911,192
COATED WIRE PRODUCTS

Elihu J. Aronoff, Framingham, and Kewal Singh Dhami, Shrewsbury, both of Mass., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,302
Int. Cl.[2] H01B *3/44;* **C09D** *3/78*
U.S. Cl. 428—379 **15 Claims**

1. A wire product having an extruded insulation coating thereon, said extruded coating comprising a mixture of a fluorocarbon polymer and a blend of at least two polyallylic esters, said polyallylic esters in said blend being incorporated in said mixture in an amount sufficient to promote crosslinking of said polymer, one of said polyallylic esters being a diallylic ester of a dicarboxylic acid in which the carboxylic groups are connected by an organic radical selected from the group consisting of alkyl, cycloalkyl, mixed alkyl-cycloalkyl and aralkyl radicals, and the other of said polyallylic esters being selected from the group consisting of triallyl esters and tetraallyl esters of aromatic or heterocyclic aromatic carboxylic acids and triallyl esters of isocyanuric acid, the ratio of said esters in said blend in such proportions so as to produce a combination of elongation and deformation resistance in said polymer which is greater than the average of such properties obtained with the individual esters when used alone.

3,911,193
COATED GRANULATES OF ETHYLENE/VINYL ACETATE COPOLYMERS

Raoul Resz, Bensberg-Refrath; Herbert Bartl, Odenthal-Hahnenberg, and Gerhard Hohmann, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation of Ser. No. 292,444, Sept. 26, 1972, abandoned. This application Apr. 4, 1974, Ser. No. 457,897

Claims priority, application Germany, Sept. 2[illegible] 1971, 2148224

Int. Cl.[2] B32B *27/08, 27/30*

U.S. Cl. 428—407 **4 Claims**

1. A treated granulate produced by the process comprising coating a copolymer of ethylene and vinyl acetate having an ethylene to vinyl acetate molar ratio of from 3:1 to 10:1 with an aqueous dispersion of a polymer consisting of polymerized (A) 70 to 100% by weight of at least one methacrylic acid ester of the formula

wherein R is propyl, butyl, amyl or cyclohexyl and (B) up to 30% by weight of at least one ethylenically unsaturated compound of the formula

wherein *X* is phenyl, halogen substituted phenyl, alkyl substituted phenyl wherein each alkyl moiety has from 1 to 4 carbon atoms or —COOR′ wherein R′ is alkyl or cycloalkyl having up to 12 carbon atoms.

3,911,194
METHOD FOR FORMING PURE METAL OR NON-METAL DEPOSITS

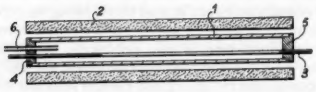
Jacques Dejachy, Saint-Cloud, and Jacques Gillardeau, Longjumeau, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 1, 1973, Ser. No. 412,016

Claims priority, application France, Nov. 7, 1972, 72.39334

Int. Cl.[2] C23C *11/02*

U.S. Cl. 428—408 **14 Claims**



1. A method for forming pure metal deposits, said method consisting in introducing, in the vapour state, at least one metal or metalloid fluoride of higher valence selected from the group consisting of: WF_6, MoF_6, ReF_6, PtF_6, TaF_5, NbF_5, BF_3, TiF_4, SiF_4, CF_4 into an enclosure containing at least one substratum to be metal-coated and a source of the metal to be deposited selected from the group consisting of nickel, copper, aluminum, zinc, cadmium, molybdenum, tungsten and zirconium, heating said source in order that the higher valence fluoride is transformed, when contacting said source, into at least one sub-fluoride of the source metal which coats the substratum and is transformed into fluorine and into the metal, which constitutes the desired deposit.

3,911,195
COPY PAPER

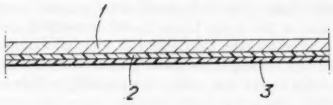
Joachim Schmidt, Weilstrasse 22, 637, Oberursel, and Martin Unruh, Vannstrockestrasse 30, 763 Lahr, Sulz, both of Germany

Filed June 1, 1972, Ser. No. 258,876

Claims priority, application United Kingdom, Oct. 23, 1970, 50530/70

Int. Cl.[2] B41C *1/06;* **D21H** *1/28*

U.S. Cl. 428—411 **15 Claims**



1. A sheet of coated paper suitable for use as a multi-copy paper comprising a support layer and a substantially uniform layer of finely particulate mutually adherent particles of a vinyl chloride polymer, the polymer having been produced by emulsion polymerisation, containing from 0.01 to 4.0 percent by weight of emulsifier, having a K-value in the range from 60 to 80, the particles having an average size of 50μ or less and having sieve residues under standard DIN conditions of not more than 34 percent by weight.

3,911,196
MAGNETIC TAPE BINDER SYSTEM

Rodolfo Bautista Navidad, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sept. 30, 1974, Ser. No. 510,455

Int. Cl.[2] B32B *5/16*

U.S. Cl. 428—425 **4 Claims**

1. In a magnetic medium wherein the medium comprises a nonmagnetic substrate with a magnetic coating thereon, said coating comprising a dispersion of magnetic particles held in a resinous organic binder, the improvement comprising a binder containing from 35 to 75% of a polyurethane resin, from 10 to 20% of a phenoxy resin and from 15 to 45% of a vinylidine chloride-acrylonitrile resin, all percentages being by weight.

3,911,197

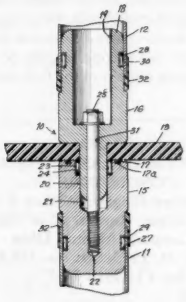
GAS BARRIER

Jack L. Kruger, Tibbetts Hill Road, Goffstown, N.H. 03045

Filed June 2, 1972, Ser. No. 258,999. The portions of the term of this patent subsequent to July 7, 1990, has been disclaimed.

Int. Cl.[2] H01B 9/04

U.S. Cl. 174—28 1 Claim



1. In a rigid coaxial transmission line having concentric inner and outer tubular conductor elements wherein spaced insulative discs are used along said line to maintain the inner and outer conductor elements in concentric spaced relation, an improved gas barrier for preventing passage of gas past each said insulative disc comprising

an electrically conductive connector having a cylindrical body portion and a bullet portion extending therefrom.

said bullet portion having an axial passage there through, said bullet portion adapted to extend through the insulative disc used to maintain the inner and outer conductor elements of the transmission line in concentric spaced relation,

a cooperating connector portion having a cylindrical recess adapted to receive therein said bullet portion, said recess being of greater depth than the length of said bullet portion extending beyond said insulative disc,

an annular resilient sealing means carried in a circular groove in the end of said cooperating connector portion for making sealing engagement with said insulative disc, an axially located and threaded hole at the bottom of the said cylindrical recess in said cooperating connector portion,

a bolt extending through the axial passage in said bullet portion and into said threaded hole, for drawing the parts together, whereby said disc will be pressed against said annular resilient sealing means in gas tight relation,

an annular groove around the interior wall of said cylindrical recess,

a coiled spring in said annular groove adapted to make electrical contact between said bullet portion and said cooperating connector portion when said portions are assembled,

an outside annular groove in the external surface of the cylindrical body portion from which said bullet extends, an outside annular groove about said cooperating connector portion,

a coiled spring carried in each of said outside grooves,

and slip ring members slidably carried on said cylindrical body portion and on said cooperating connector portion to cover said coiled springs in the said outside annular grooves and to accommodate the end portions of said rigid inner conductors.

3,911,198

CONTACT ASSEMBLY FOR A METAL-CLAD, GAS-INSULATED HIGH-VOLTAGE LINE

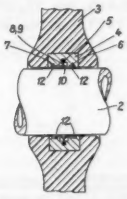
Karl-Heinz Picard; Wolfgang Busch, and Jürgen Plage, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 9, 1974, Ser. No. 530,966

Claims priority, application Germany, Jan. 8, 1974, 2401093

Int. Cl.[2] H01B 9/04

U.S. Cl. 174—28 9 Claims



1. In a metal-encapsulated, gas-isolated high-voltage line having at least one electric conductor for carrying the high-voltage, the conductor being supported with respect to the metal enclosure by an insulator defining a surface facing the conductor, the insulator having an electrode at said surface and having at least one slide bearing member for slidably carrying the conductor in the insulator, the slide bearing being made of a material having a hardness less than the hardness of the conductor, and a contact assembly for electrically connecting the electrode to the conductor whereby the electrode is at the potential of the conductor, the contact assembly comprising: a resilient yoke made of electrically conductive material having respective end-portions conjointly defining an obtuse angle; and, carbon contact members mounted on corresponding ones of said end portions for electrically contacting the conductor.

3,911,199

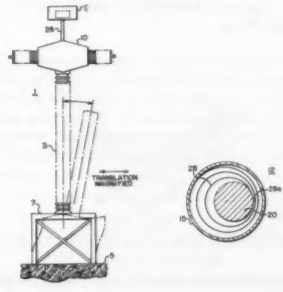
SEISMIC MOTION-DAMPER FOR UPSTANDING ELECTRICAL EQUIPMENT

Edward G. Fischer, Verona, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 26, 1974, Ser. No. 464,729

Int. Cl.[2] F16F 7/10, 9/00; H02B 5/00

U.S. Cl. 174—42 1 Claim



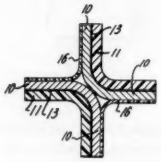
1. In combination, upstanding electrical equipment and a tuned damping device affixed adjacent a high point of said upstanding electrical equipment, whereby sympathetic vibrations will tend to cancel out damaging vibrations, said damp-

ing device comprising a container having a liquid-fluid disposed therein, an inertia element disposed within said container, and a helically-configured damping element provided interiorly within said container having one end thereof affixed to the internally-disposed inertia element and its other end affixed to the outer container.

3,911,200
ELECTRICAL CABLE HOUSING ASSEMBLIES

Herbert D. Simons, Long Valley, N.J., and Frank E. Timmons, Richmond, Ind., assignors to Sun Chemical Corporation, New York, N.Y.

Division of Ser. No. 323,950, Jan. 15, 1973. This application Aug. 20, 1973, Ser. No. 389,894
Int. Cl.[2] H01B *7/34*
U.S. Cl. 174—36 **3 Claims**

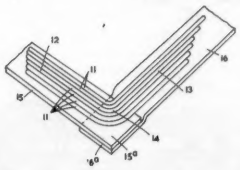


1. A cable housing assembly for carrying a plurality of cables comprising a jacket of flexible insulating material enclosing a shielding tape comprising in combination (a) a thin elongated flexible film of material having relatively high electrical resistance insulation characteristics and (b) a thin elongated flexible foil of material having relatively low electrical resistance characteristics and having one surface thereof bonded to one surface of said film (a) and being coextensive therewith, said shielding tape being folded along a longitudinally extending crease, thereby to be doubled in thickness, said thin foil (b) having a thin layer of bonding material disposed on the surface thereof which is opposite to its said one surface bonded to said film (a), whereby a foil-to-foil connection is made by said thin layer of bonding material.

3,911,201
WIRING HARNESS AND METHOD OF MAKING SAME

William Lawrence Fry, Haughton, England, assignor to Rist's Wires & Cables Limited, Birmingham, England

Filed Mar. 22, 1974, Ser. No. 453,975
Claims priority, application United Kingdom, Apr. 4, 1973, 16065/73
Int. Cl.[2] H02G *3/02*; **H01B** *13/00*
U.S. Cl. 174—72 A **9 Claims**



1. A wiring harness including a plurality of leads each of which comprises a conductive core in a thermoplastic sheath, a first flexible elongate thermoplastic backing strip to which the sheaths of a first length of the leads are fused, a second flexible elongate thermoplastic backing strip to which the sheaths of a second length of the leads are fused, the second backing strip extending at an angle to the first backing strip, a region of the second backing strip overlapping and being secured to the first backing strip so as to interconnect the first and second backing strips, and the leads being bent adjacent the inter-connection of the first and second backing strips so as to extend from one backing strip onto the other backing strip.

4. A method of manufacturing a wiring harness including starting with a plurality of leads each of which comprises a conductive core in a thermoplastic backing strip, fusing to the sheaths of a first length of said leads a first elongate flexible thermoplastic backing strip, arranging a second length of said leads at an angle to said first length of said leads, fusing to said second length of the sheaths of the leads a second flexible elongate thermoplastic backing strip, overlapping regions of the first and second backing strips adjacent the bend in the leads between the first and second lengths of the leads and, securing said overlapping regions of the first and second backing strips together.

3,911,202
ELECTRON CURED PLASTIC INSULATED CONDUCTORS

Clifford R. Stine, Bedford Heights; William J. Herbert, Mantua, and Bruce E. Klipec, Aurora, all of Ohio, assignors to Samuel Moore & Company, Mantua, Ohio

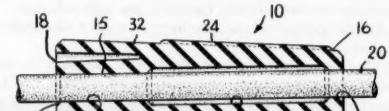
Filed Jan. 31, 1973, Ser. No. 328,366
Int. Cl. H01b *7/02*
U.S. Cl. 174—120 SR **13 Claims**

1. An electrically insulated conductor comprising an electrical conductor and a layer of heat resistant, radiation resistant, substantially dimensionally stable electrical insulation having a hardness of at least about Shore A 50 and a tensile strength at 100% elongation of at least about 400 p.s.i. about said electrical conductor, said insulation being the non-thermoplastic product of the electron curing with a dosage of at least about 1 megarad of a thermoplastic elastomer reinforced and hardened with from about 50 to about 250 parts of a filler per 100 parts of a thermoplastic elastomer, said insulation containing substantially the same amount of filler as the thermoplastic composition subjected to electron curing.

3,911,203
CABLE BOOT

Michael P. Goldowsky, Tarrytown, N.Y., assignor to Kings Electronic Company, Inc., Tuckahoe, N.Y.

Filed Mar. 7, 1974, Ser. No. 449,089
Int. Cl.[2] H01B *17/00*
U.S. Cl. 174—138 F **9 Claims**



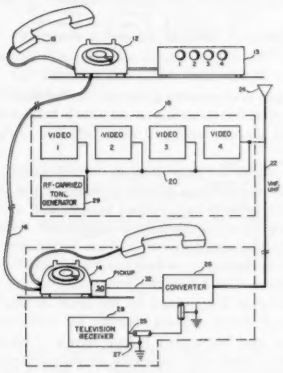
1. A boot for cables comprising an elongated body of resilient material, a first bore extending partially along the length of said elongated body, at least one additional second bore of lesser diameter than said first bore in communication with said first bore, said second bore extending the remaining length of said elongated body, the material surrounding said second, bore comprising a finger adapted to contact the surface of a cable, an extension surrounding said finger and being con-

nected to said body only in the region at which second bore communicates with said first bore, an annular slot separating said extension from said finger, said finger extending substantially along the length of said second bore.

3,911,204
TELEPHONE ADDRESSED CLOSED CIRCUIT TELEVISION CONVERTER SYSTEM

Robert R. Spinelli, North Miami, Fla., assignor to K. Gordon Murray, Key Biscayne, Fla.

Filed June 25, 1973, Ser. No. 373,502
Int. Cl.[2] H04N *1/44*
U.S. Cl. 178—5.1 **27 Claims**



1. Apparatus adapted for use with a television receiver and a telephone instrument co-located with said television receiver comprising: means for picking up predetermined coding signals received into said telephone instrument; and

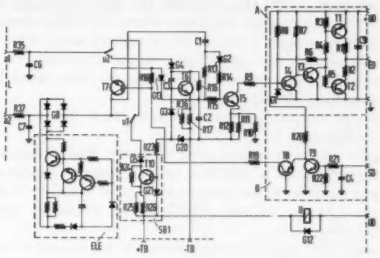
a converter having inputs coupled to receive signals from said pickup means and from multiple television signals having carrier frequencies which are not receivable by said television receiver, said converter comprising means for converting any selected one of said multiple television signals to a frequency which is compatible with a channel of said television receiver only subsequent to receipt by said pickup means of a predetermined coding signal corresponding to the selected television signal.

3,911,205
CIRCUIT ARRANGEMENT FOR CONNECTING TELEGRAPH AND DATA SUBSCRIBERS TO A SWITCHING SYSTEM

Fritz Giebler, and Peter Rath, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jan. 7, 1974, Ser. No. 431,065
Claims priority, application Germany, Jan. 16, 1973, 2302024
Int. Cl.[2] H04L *25/00*
U.S. Cl. 178—2 R **7 Claims**

1. A circuit arrangement for connecting telegraph and data subscribers to the four-wire interface of a switching system over two-wire single-current lines, comprising an electronically adjustable resistor means (ELE) for setting the subscriber line current comprising an electronically adjustable resistor, a flattening network coupled to the output of the two-wire line and comprising an RC network, electronic circuit means connected to the output of said RC network for generating steep pulse edges, means for reversing the polarity of said two-wire single current lines and permitting sending in the direction from the interface to the subscriber comprising a switching transistor (T7) operating as a break contact or as a make contact interposed in said two-wire single current lines

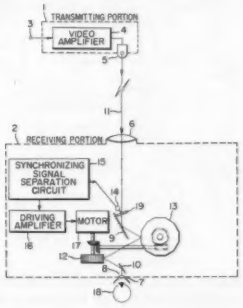


and responsive to the data at said four-wire interface, and an electronic current-limiting circuit (SB1) connected in said two-wire single current lines to take over the logic function of a holding resistor.

3,911,206
IMAGE COMMUNICATION SYSTEM

Takuya Nasu, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 31, 1973, Ser. No. 393,281
Claims priority, application Japan, Sept. 1, 1972, 47-87752; Sept. 1, 1972, 47-87753; Sept. 1, 1972, 47-87754; Sept. 1, 1972, 47-87755; Sept. 1, 1972, 47-87756
Int. Cl. H04b *9/00*
U.S. Cl. 178—6 **9 Claims**



1. An image communication system comprising a transmitting portion having a light emitting means for intensity modulating a beam of light with a video signal; and a receiving portion having an eyepiece adapted for directly viewing said transmitting portion comprising means for deflecting in horizontal and vertical directions said light beam from said transmitting portion.

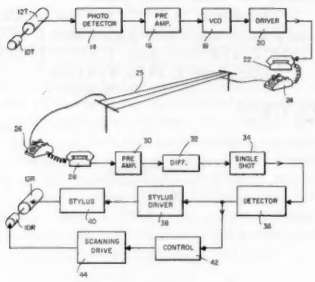
3,911,207
FM DEMODULATOR AND CONTROL CIRCUITRY FOR A FACSIMILE SYSTEM

Morris N. Barwick, Orlando, Fla., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Nov. 21, 1973, Ser. No. 417,797
Int. Cl.[2] H04N *1/40*
U.S. Cl. 178—6 **14 Claims**

1. A facsimile system producing a copy at one location which is a facsimile of a document located at another location comprising:

a transmitter including:
means for detecting the light-dark variations in a document, and
means for generating FM signals having frequencies ranging from 1,500 Hz. to 2,400 Hz. in response to the detected light-dark variations where 1,500 Hz. substantially represents white on the document and 2,400 Hz. substantially represents black on the document;
a communications network coupled to the transmitter for transmitting FM signals; and
a receiver coupled to the communications network and including:
trigger means for generating relatively high frequency trigger signals in response to and having a frequency proportional to the frequency of said 1,500 to 2,400 Hz. FM signals and relatively low frequency noise signals;
a single shot multivibrator coupled to the output of said means for generating trigger signals and characterized by an astable state of fixed duration initiated in response to said trigger signals and said relatively low frequency noise signals wherein the ratio of the astable

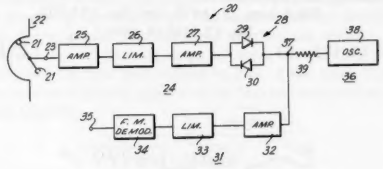


state duration to the period of a multivibrator cycle is directly proportional to the frequency of the FM signals;
detector means coupled to the output of said single shot multivibrator for generating a control signal representing the ratio of the astable state to the period of said multivibrator cycle;
writing means coupled to the output of said detector means and responsive to said control signal for marking on a copy medium to reproduce said light-dark variations of said document on said copy medium;
scanning means for moving said writing means relative to said copy medium; and
control means having an input connected to the output of said detector means and an output connected to the input of said scanning means for biasing said scanning means into a deenergized state when the ratio of said astable state to the period of the multivibrator cycle is less than a predetermined value and overcoming said bias to initiate scanning by said scanning means when the ratio of said astable state to the period of the multivibrator cycle is greater than said predetermined value for a predetermined length of time.

3,911,208
DROP-OUT COMPENSATING CIRCUIT

Takaaki Tohma, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 31, 1974, Ser. No. 475,253
Claims priority, application Japan, June 7, 1973, 48-64131; June 7, 1973, 48-64132
Int. Cl. H04n *5/42*
U.S. Cl. 178—6.6 DC **11 Claims**

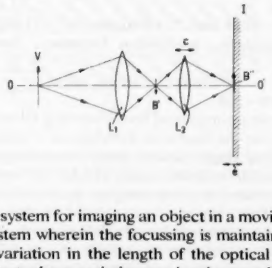


1. A drop-out compensating circuit, comprising:
an input circuit for receiving an angularly modulated signal, the input circuit having a relatively low output impedance;
an output circuit for providing an output signal;
a source for supplying a complementary signal, the source having a relatively high output impedance; and
variable impedance means having an input terminal connected to said input circuit and an output terminal connected in common to said output circuit and to the output of said source, said variable impedance means exhibiting an impedance determined by the level of said angularly modulated signal applied thereto by said input circuit such that said impedance is less than said source output impedance when said angularly modulated signal level is greater than a predetermined level so as to bypass said complementary signal applied to said output terminal by said sourcee, and said impedance is relatively high when a drop-out causes said angularly modulated signal level to be less than said predetermined level to thereby enable said complementary signal applied to said output terminal to be coupled to said output circuit.

3,911,209
OPTICAL SYSTEM FOR IMAGING AN OBJECT, THE FOCUSSING BEING MAINTAINED INDEPENDENT OF A VARIATION IN THE DISTANCE BETWEEN THE OBJECT PLANE AND THE IMAGE PLANE

Gijsbertus Bouwhuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 21, 1973, Ser. No. 418,061
Claims priority, application Netherlands, Dec. 1, 1972, 7216306
Int. Cl.[2] **G02B** *7/02;* **G11B** *7/12*
U.S. Cl. 178—6.6 R **2 Claims**



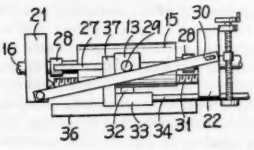
1. Objective system for imaging an object in a moving plane, for use in a system wherein the focussing is maintained independent of a variation in the length of the optical path between the object plane and the moving image plane, said system having an optical axis moveable transversely with

respect to the moving plane said system comprising a first lens system means for forming a reduced primary image of the object, said first lens system being fixed along said optical axis, and a second lens system means adjacent said first lens system means for forming an enlarged secondary image of said primary image, said second lens system being movable along the optical axis of said optical system, whereby the ratio of the axial image motion to the motion of the second lens system means is greater than one.

3,911,210
RECORDING HEAD SHIFTING MECHANISM OF CYLINDER-SCANNING TYPE IMAGE RECORDING DEVICE

Takashi Oji, 47-3, Saiin Hideri-cho, Ukyo-ku, and Takeshi Yamazaki, 4, Minamifunaoka-cho, Kita-ku, both of Kyoto, Japan

Filed June 22, 1973, Ser. No. 372,482
Claims priority, application Japan, Aug. 4, 1972, 47-92310
Int. Cl.² H04N *1/22*; **G03F** *7/02*; **G01D** *15/00*
U.S. Cl. 178—6.6 R **4 Claims**



1. A recording head shifting mechanism for a cylindrical scanning type image recording device, wherein the surface of a recording cylinder may be squeezed by a doctor blade smoothly and efficiently without catching on burrs or the like on the surface of said recording cylinder, comprising,

a cylindrical scanning recording device having a recording cylinder,

a recording head for movement parallel to the longitudinal axis of said recording cylinder,

a guide bar in spaced apart relationship with said recording cylinder,

means extending from said recording head to said guide bar to make said recording head responsive to changes in inclination of said guide bar, and

means to change the angle of inclination of said guide bar with respect to the longitudinal axis of said recording cylinder.

3,911,211
STOP FRAME FOR OPTICAL PLAYBACK SYSTEM

John L. Rennick, Elmwood Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 17, 1974, Ser. No. 461,573
Int. Cl.² H04N *5/76*; **G11B** *17/00*
U.S. Cl. 178—6.6 R **7 Claims**

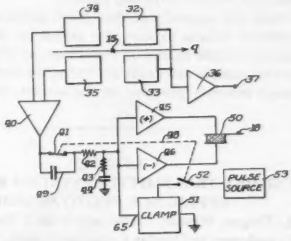
1. In an optical playback system having means for developing a reading beam, means for controlling said beam to scan the record track of an optical video record to derive a signal representing information stored in said record, and a servo system for adjusting the scanning position of said beam in relation to said video record, the improvement in accordance with which said servo system comprises:

means for developing a correction signal for adjusting the scanning position of said beam;

beam-deflection means, including an optical element biased to a reference position in the path of said beam, responsive to said correction signal for displacing said element away from said reference position in a direction and amount determined by said correction signal;

feedback means for applying said correction signal to said beam-deflection means;

clamping means included in said feedback means having a first operating condition in which said feedback means energizes said beam-deflection means in accordance with said correction signal and having a second operating



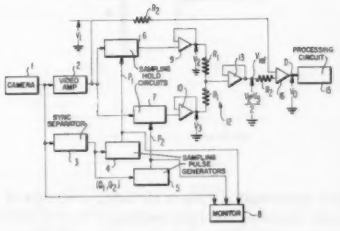
condition in which said feedback means is clamped to a reference signal condition periodically for a short interval once each revolution of said video record to establish a fixed predetermined energization of said beam-deflection means; and

means for selectively actuating said clamping means between its aforesaid first and second operating conditions.

3,911,212
THRESHOLD DEVICE FOR CONVERTING VIDEO SIGNAL TO BINARY VIDEO SIGNALS AND METHOD OF DETERMINING THRESHOLD LEVEL

Kiyoshi Yoshizawa, Musashino, and Kiichi Yamaya, Kyoba, both of Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Kyoba, Japan

Filed July 30, 1974, Ser. No. 492,996
Int. Cl.² H04H *7/02*
U.S. Cl. 178—6.8 **4 Claims**



1. A threshold device for converting a video signal derived from a television camera into a corresponding binary signal, comprising:

a sync signal separator responsive to said video signal for deriving sync signals;

a first sampling pulse generator responsive to said derived sync signals for generating a first sampling pulse;

a second sampling pulse generator responsive to said derived sync signals for generating a second sampling pulse;

a first sample hold circuit for sampling and holding said video signal in response to said first sampling pulse;

a second sample hold circuit for sampling and holding said video signal in response to said second sampling pulse;

a summing network responsive to said first and second sample hold circuit for providing a reference signal equal to the average of the sampled values of said video signal;

a comparator responsive to said video and said reference signal for providing a binary video signal depending upon

whether said video signal is larger than said reference signal; and

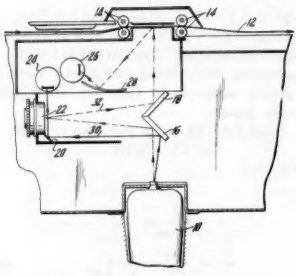
a television monitor having a screen and responsive to said video signal for displaying an image of the object scanned by said television camera means being responsive to the sample pulse generator, to provide first and second sample marks on the screen at positions corresponding to said first and second sampling pulses;

said first and second sampling pulse generators having adjustment means to vary the positions of said first and second sample marks on the screen so that said first and second sample marks are shifted to the highest and lowest image intensity portions on the screen, respectively.

3,911,213
FACSIMILE TRANSMITTING SYSTEM EMPLOYING REFERENCE PHOTO SENSOR

John L. Tregay, Weston, Conn., and Paul Z. Boros, New York, N.Y., assignors to Comfax Communications, Inc., New York, N.Y.

Filed June 11, 1974, Ser. No. 478,330
Int. Cl.² H04N *3/16*
U.S. Cl. 178—7.1 **7 Claims**

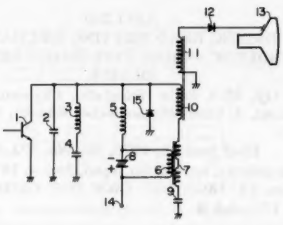


1. In a transmission system including a source of light and means for scanning the light produced by said source over a medium having an information content, said system comprising first and second light-responsive means, a first reflecting surface positioned intermediate said source and said medium for reflecting a first portion of said light to said first lightresponsive means without being first incident on said medium, said first light-responsive means being effective to produce a reference signal bearing a direct relationship to the intensity of the light from said source, means including said first reflecting surface and a second reflecting surface for directing a second portion of said light first onto said medium and then to said second light-responsive means, said second light-responsive means being effective to produce an image signal bearing a relationship to the intensity of light derived from said medium that corresponds to the information content of the portion of said medium on which light from said source is then incident, and means for operatively combining said reference signal and said image signal to develop a data signal that is indicative of the information content of the portion of said medium being scanned and is substantially independent of variations in the intensity of light produced by said source.

3,911,214
REGULATED HIGH VOLTAGE POWER SUPPLY CIRCUIT

Katsumi Mitsuda, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 30, 1973, Ser. No. 383,540
Claims priority, application Japan, Aug. 1, 1972, 47-77492
Int. Cl.² H04N *3/18*
U.S. Cl. 178—7.5 R **4 Claims**

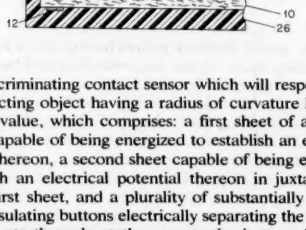


1. A regulated high voltage power supply circuit including an output transistor to effect switching operation, a flyback transformer having an output winding and a high voltage winding, a high voltage controlling saturable reactor having a controlling winding and a controlled winding, means to rectify a pulse generated in said high voltage winding for producing a voltage to be applied to an anode of a cathode ray tube, said output transistor being connected to a series circuit consisting of the output winding of said flyback transformer, the controlled winding of said saturable reactor and the controlling winding of said saturable reactor, said series circuit being connected to a power supply, said circuit characterized in that fluctuations in the anode voltage of said cathode ray tube or fluctuations in the beam current thereof are directly detected by causing a current from said power supply adapted to supply electric power to said output transistor and said output winding to flow directly through said controlling winding.

3,911,215
DISCRIMINATING CONTACT SENSOR

George S. Hurst, and William C. Colwell, Jr., both of Oak Ridge, Tenn., assignors to Elographics, Inc., Oak Ridge, Tenn.

Filed Mar. 18, 1974, Ser. No. 452,784
Int. Cl.² H01H *43/08;* **H04N** *1/00*
U.S. Cl. 178—18 **6 Claims**



1. A discriminating contact sensor which will respond only to a contacting object having a radius of curvature less than a specific value, which comprises: a first sheet of a flexible material capable of being energized to establish an electrical potential thereon, a second sheet capable of being energized to establish an electrical potential thereon in juxtaposition with the first sheet, and a plurality of substantially uniform discrete insulating buttons electrically separating the first and second sheets throughout the sensor, the buttons having a height and an average spacing whereby the maximum radius of curvature of the object to which the sensor will respond is approximately equal to the square of the average spacing

between the buttons divided by eight times the height of the buttons.

3,911,216

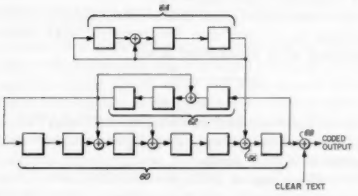
NONLINEAR CODE GENERATOR AND DECODER FOR TRANSMITTING DATA SECURELY

Douglas J. Bartek, Phoenix, and Thomas H. Howell, Scottsdale, both of Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Dec. 17, 1973, Ser. No. 425,590

Int. Cl.² H04L *9/04*

U.S. Cl. 178—22 **4 Claims**



1. Code apparatus for use in the transmission of digital data in coded form comprising a first shift register having a plurality of serially connected bistable stages, at least one feedback loop interconnecting the output of one stage and the input of a preceding stage of said first shift register; a second shift register having a plurality of serially connected bistable stages, said second shift register interconnected in said feedback loop of said first shift register whereby cycling of said first and second shift registers is interdependent; at least one feedback loop interconnecting the output of one stage and the input of a preceding stage of said second shift register; and logic means interconnecting the output of one stage of said second shift register to said first shift register whereby said first and second shift registers cooperatively function to produce an effectively nonlinear code.

3,911,217

MOUNTING ARRANGEMENT FOR ELECTRICAL COMPONENTS

Thomas Georgopulos, Chicago, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

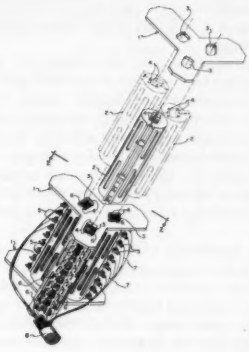
Filed Aug. 30, 1973, Ser. No. 393,263

Int. Cl.² H01F *17/08*; **H02G** *15/12*; **H01F** *27/06*

U.S. Cl. 178—46 **12 Claims**

1. A stackable assembly for electrical components, comprising:

a mounting plate having an aperture therethrough; a first container for an electrical component, said first container including resilient tabs on one end thereof, said tabs adapted to engageably snap into one portion of said aperture; a second container for an electrical component, said second container including resilient tabs on one end thereof, said tabs adapted to engageably snap into another portion of said aperture whereby said containers



may be stacked on opposite sides of said mounting plate to form a stackable assembly.

3,911,218

TIME DIVISION INFORMATION TRANSMITTING AND RECEIVING SYSTEMS

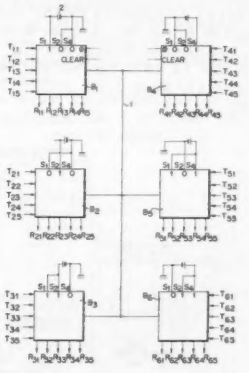
Yasoji Suzuki, Kanagawa, and Tomohisa Shigematsu, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Sept. 17, 1973, Ser. No. 397,746

Claims priority, application Japan, Sept. 22, 1972, 47-95587; Sept. 25, 1972, 47-95914

Int. Cl.² H04J *3/06*

U.S. Cl. 178—50 **9 Claims**



1. In a system for transmitting and receiving elements of information on a time division basis over a common transmission line interconnecting a plurality of spatially separated transmitting and receiving stations, each of said stations comprising:

an address counter for counting clock signals in synchronism with the address counters in other stations;

a plurality of terminals to which bias voltages are externally applied, the bias voltages being adapted to select information transmission and reception time slots of the station

as a function of a logical combination of the bias voltage levels;

first means, including an address decoder, responsive to the outputs of said address counter and the bias voltages for producing a plurality of information transmitting time division signals responsive to said address counter counting values contained in the information transmission time slot selected as a function of the logical combination of the bias voltages;

second means responsive to the outputs of said address counter and the bias voltages for producing a plurality of information receiving time division signals responsive to said address counter counting values contained in the information reception time slot selected as a function of the logical combination of the bias voltages;

third means responsive to the information transmitting time division signals for transmitting the elements of information to said common transmission line in a predetermined sequence;

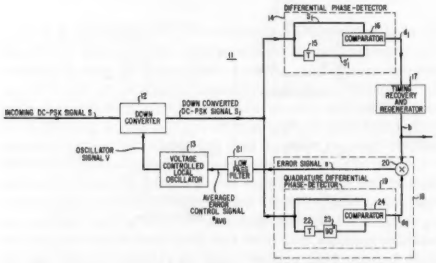
fourth means responsive to the information receiving time division signals for separating the elements of information supplied from another station through said common transmission line, said fourth means including a plurality of first logic gate means, the number of first logic gate means being equal in number to the number of information elements to be received, on input of each of said first logic gate means being connected to said common transmission line and the other inputs of said first logic gate means being connected to receive corresponding information receiving time division signals; and

a plurality of first flip-flop circuits, the number of said flip-flop circuits being equal to the number of said first logic gate means, each flip-flop circuit having a reset terminal, a set terminal and first and second output terminals, the reset terminal of each flip-flop circuit being connected to receive a third address decoded signal from said address decoder of said first means, and said set terminal being connected to the output of a corresponding first logic gate means.

3,911,219
AUTOMATIC FREQUENCY CONTROL FOR DIFFERENTIALLY COHERENT PHASE DETECTION

Joe Hill Mullins, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 11, 1974, Ser. No. 450,090
Int. Cl.² H04L *27/16, 27/23*
U.S. Cl. 178—88 **11 Claims**



1. Apparatus for use in a receiver which receives a DC-PSK signal, said signal comprising a carrier at a frequency w_c which provides a means for carrying first and second states of a transmitted binary signal via first and second phase differences, respectively, between the oscillations of said carrier occurring during successive T second intervals comprising

oscillator means for generating an oscillating signal at a frequency w_o;

down converter means for mixing said DC-PSK signal and said oscillating signal to produce a down converted DC-PSK signal at an intermediate difference frequency w_{if};

differential phase detector means responsive to said down converted signal for recovering therefrom a recovered binary signal which corresponds to said transmitted binary signal, said recovered binary signal comprising opposing polarity pulses which correspond, respectively, to said first and second states of said transmitted binary signal;

quadrature differential phase detector means also responsive to said down converted signal for generating an output signal having a polarity during a substantial portion of the duration of each of said pulses which is the same as or opposite to the polarity of such pulse depending upon whether said frequency w_{if} is above or below a preselected frequency w_{if} ;

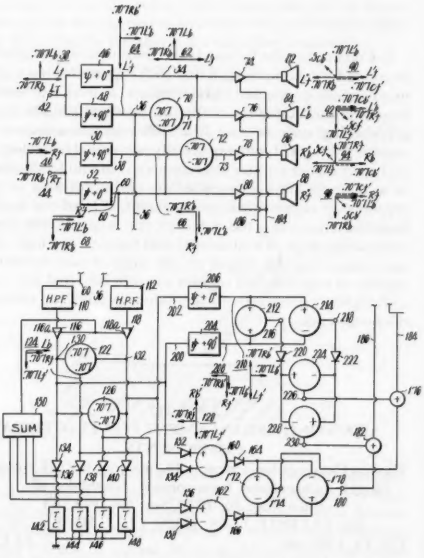
means for multiplying said recovered binary signal with said output signal, thereby developing an error control signal having substantially one polarity when said frequency w_{if} is above w_{if} and substantially the opposite polarity when said frequency w_{if} is below w_{if} ;

and means for applying said error control signal to said local oscillator to control said frequency w_o such that said frequency w_{if} is maintained at w_{if}

3,911,220
MULTISOUND REPRODUCING APPARATUS

Katsuaki Tsurushima, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 4, 1972, Ser. No. 278,047
Claims priority, application Japan, Aug. 6, 1971, 46-59483; Aug. 16, 1971, 46-62104
Int. Cl.² H04R *5/00*
U.S. Cl. 179—1 GQ **2 Claims**



1. In a quadraphonic sound reproducer having a decoder for separating first and second composite signals L_T and R_T into four separate output signals containing left front, left back, right back and right front signals L_f, L_b, R_b and R_f as dominant components and for transmitting the separated output signals through individual variable gain amplifiers disposed in respec-

tive signal channels, and wherein the gains of said variable gain amplifiers are controlled by gain controlling signals produced by front-back logic means and by wave-matching logic means, the latter including first logic signal producing means for producing a first logic signal which is a function of the L_f and R_f signal components included in said composite signals and second logic signal producing means for producing a second logic signal which is a function of the R_b and L_b signal components included in said composite signals, apparatus for gradually changing the gains of said variable gain amplifiers as the signal components contained in said composite signals change comprising:

a first differential amplifier having a positive input terminal for receiving said first logic signal, and a negative input terminal;

a first time constant circuit connected to said first differential amplifier negative input terminal for receiving said second logic signal, such that said first differential amplifier negative input terminal is supplied with a signal for a predetermined time duration subsequent to the cessation of said second logic signal;

a second differential amplifier having a positive input terminal for receiving said second logic signal, and a negative input terminal;

a second time constant circuit connected to said second differential amplifier negative input terminal for receiving said first logic signal, such that said second differential amplifier negative input terminal is supplied with a signal for a predetermined time duration subsequent to the cessation of said first logic signal; and

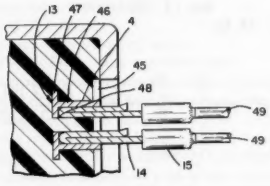
means for supplying the outputs of said first and second differential amplifiers to said individual variable gain amplifiers as at least portions of said gain controlling signals.

3,911,221

SPEAKER SUPPORT SYSTEM

Christopher R. Wong, 30 Carlson Court, San Anselmo, Calif. 94960

Filed Dec. 5, 1974, Ser. No. 529,951
Int. Cl.² H04R *1/02*
U.S. Cl. 179—1 R **10 Claims**



1. A speaker support system comprising in combination:

a. a speaker;

b. an elongated rigid metal track member;

c. elongated non-conductive sound-suppressive support means carried by said elongated rigid metal track member;

d. elongated electrical conducting means embedded within said non-conductive sound-suppressive support means and accessible therefrom for electrical connection and disconnection;

e. a support arm slidably and rotatably engaged at one end with said non-conductive sound-suppressive support means and having affixed by joint means at the other end the speaker; and

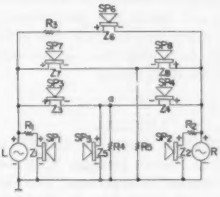
f. means electrically connected to such speaker capable of being electrically connected to and disconnected from the elongated electrical conducting means.

3,911,222

METHOD AND A DEVICE FOR PRODUCING A 4-CHANNEL STEREOPHONIC SOUND FIELD

Kazuo Kamata, and Shogo Shigeyama, both of Tokyo, Japan, assignors to Trio Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 187,313, Oct. 7, 1971. This application Sept. 10, 1973, Ser. No. 395,641
Claims priority, application Japan, Dec. 9, 1970, 45-109089; Jan. 19, 1971, 46-1297; Jan. 15, 1971, 46-6675
Int. Cl. H04r *5/00*
U.S. Cl. 179—1 GQ **5 Claims**



1. An encoding method for producing 2-channel stereophonic signals from a 4-channel stereophonic sound field production, constituted by front-left, front-right, rear-left and rear-right channel signals, comprising:

a. obtaining a phase difference of 90° between said rear-right signal and said rear-left signal;

b. mixing said front-left signal, said front-right signal and said rear-left signal having passed through the above step at a sound level ratio of substantially 1 : 0.7 : 0.7 respectively thereby obtaining a left signal of said 2-channel stereophonic signals; and

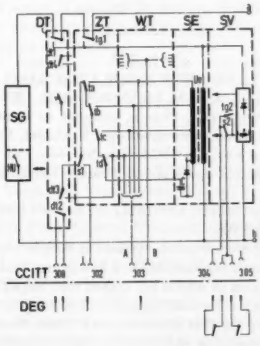
c. mixing said front-right signal, said front-left signal and said rear-right signal at a sound level ratio of substantially 1 : 0.7 : 0.7 respectively thereby obtaining a right signal of said 2-channel stereophonic signals.

3,911,223

CIRCUIT ARRANGEMENT FOR SUBSCRIBER STATIONS IN TELECOMMUNICATIONS INSTALLATIONS, ESPECIALLY TELEPHONE INSTALLATIONS WITH AUXILIARY DATA TRAFFIC

Wolfgang Burger, and Werner Vollmeyer, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 204,145, Dec. 2, 1971, abandoned. This application Jan. 9, 1974, Ser. No. 431,909
Int. Cl.² H04M *11/06*
U.S. Cl. 179—2 DP **5 Claims**



1. Apparatus for telecommunication subscriber stations having dialing keyboards from which are generated tone fre-

quency signals used for completing connections between the subscriber station and a receiving station and for sending data characters to the receiving station, comprising;

character generator means for producing said tone frequency signals responsive to operation of said keyboard, subscriber connection line means extending from the subscriber station over which information is transmitted, bistable switching means having operating and non-operating positions for connecting said character generator to said subscriber connection line in the operating position at the beginning of data transmission including means for causing the sending of a predetermined tone frequency as a rest signal, said predetermined tone frequency being interruptable upon the sending of data signals, thereby indicating that signals substituting for said rest signal are data signals.

3,911,224

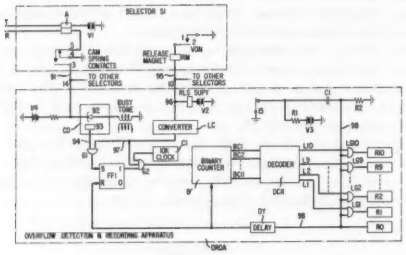
SELECTOR TRAFFIC SURVEY ARRANGEMENT

Amos Edward Joel, Jr., South Orange, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 11, 1974, Ser. No. 514,014

Int. Cl.² H04Q *1/24*

U.S. Cl. 179—8 A **12 Claims**



1. The method of detecting an overflow in a step-by-step selector and of indicating the level at which the overflow occurred, comprising the steps of

providing a first signal when a wiper of the selector leaves a rotary position indicative of an overflow,

providing a second signal when said wiper assumes an idle, down position,

timing the amount of time between the provision of said first and second signals, the

indicating the level at which the overflow occurred based upon said timed amount of time.

3,911,225

METHOD AND DEVICE FOR CHECKING AND ADJUSTING A PCM TRANSMISSION DEVICE

Guy Mignon, Argenteuil, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Feb. 27, 1974, Ser. No. 446,338

Claims priority, application France, Feb. 27, 1973, 73.06951

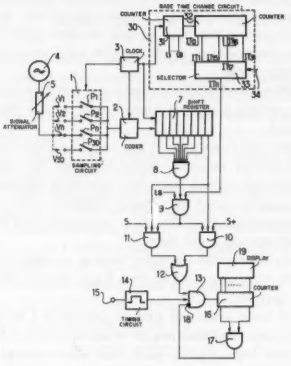
Int. Cl.² H04J *3/14*

U.S. Cl. 179—15 BF **11 Claims**

3. In a PCM transmission system in which a plurality of information signals are sampled at a first prescribed frequency and the amplitudes of which are coded into respective binary coded signals in the form of pulse trains making up respective channel signals, the first pulse in each train identifying the polarity of a respective information signal sample, with the coding of successive samples effected during successive time intervals defining, for each set of channel signals, a frame containing a series of codes of the respective samples of the information signals in each channel, an apparatus for checking the adjustment of said system comprising:

first means, responsive to the contents of the pulse train into which a selected channel signal of a prescribed polarity has been coded during each frame, for detecting each occurrence of the maximum code value permitted in said pulse train and generating a first signal indicative thereof; and

second means, coupled to said first means, for counting the number of said pulse trains having said maximum value during a prescribed time interval.



3,911,226

INSTALLATION FOR MULTIPLEX TRANSMISSION OF DIGITAL SIGNALS

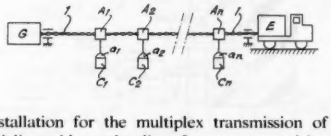
Philippe Angelle, Thouare; Jean-Claude Naudot, Nantes, and Maurice Hythier, Carquefou, all of France, assignors to Compagnie Generale de Geophysique, Massy, France

Filed May 18, 1973, Ser. No. 361,815

Claims priority, application France, May 19, 1972, 72.18138

Int. Cl.² H04J *3/08*

U.S. Cl. 179—15 AL **32 Claims**



1. Installation for the multiplex transmission of seismic signals delivered by a plurality of sensors comprising a transmission path having one end connected to a generator of first pulse signals and the other end connected to a recording unit, each sensor being coupled to the path by means of a multiplexing circuit connected in series with the path, characterized in that the generator provides a short first pulse signal at the beginning of each multiplexing cycle, that each sensor provides in digital form the detected information and that each multiplexing circuit comprises at least one shift register capable of being loaded with the digital information from said sensor and of being operatively coupled to the downstream side of the transmission path in order to apply the digital information thereto in the form of a succession of encoded pulses, the multiplexing circuit also having first pulse signal detector means coupled to the upstream side of the transmission path and means for applying clock pulses to the shift register after the detection of the first pulse signal, said means for applying clock pulses to the shift register comprising a source of clock pulses and means responsive to the detection

of the first pulse signal to apply a predetermined number of clock pulses from the source to the shift register.

3,911,227
TELECOMMUNICATION EXCHANGE APPARATUS FOR TRANSLATING SEMI-PERMANENT CHANNEL INFORMATION

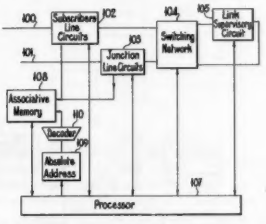
Gerald Norman Lawrence, 180 Baginton Road, and Martin Ward, 17 Exminster Road, both of Styvechale, Coventry, Warwickshire, England

Filed Dec. 1, 1972, Ser. No. 311,387

Claims priority, application United Kingdom, Dec. 3, 1971, 56229/71

Int. Cl.[2] H04Q *3/54*

U.S. Cl. 179—18 ES **1 Claim**



1. Telephone exchange apparatus for serving a plurality of exchange lines, said apparatus comprising:

A. switching means for selectively interconnecting said lines;

B. control means for operating said switching means in response to signalling information received over said lines;

C. an associative memory for storing a plurality of words of control information in respect of associated ones of said exchange lines,

i. each of said words comprising at least a selection of control information items including:

a. directory number,

b. equipment number,

c. class of service,

d. special facilities item, and

e. a PABX-line-selector control item;

D. said control means being operative to read out a said word of control information from said associative memory by the application of a selected one of said information items to all of said plurality of words in parallel,

i. identity between said selected information item and an item contained in any of said words causing the word containing the identical item to be read out and transferred to said control means for the interconnection of selected ones of said exchange lines,

E. said associative memory being employed, both for identifying the directory number of a calling exchange line whose equipment number is evident, and for identifying the equipment number of a called exchange line whose directory number is evident, said associative memory being addressed by the equipment number of the calling exchange line, and by the directory number of the called exchange line in the two cases respectively.

3,911,228
INTERCOMMUNICATION AND SECURITY SYSTEM

George G. Gow, 5163 Red Oak Drive, St. Paul, Minn. 55112

Filed Apr. 1, 1974, Ser. No. 457,051

Int. Cl. H04m *5/00*

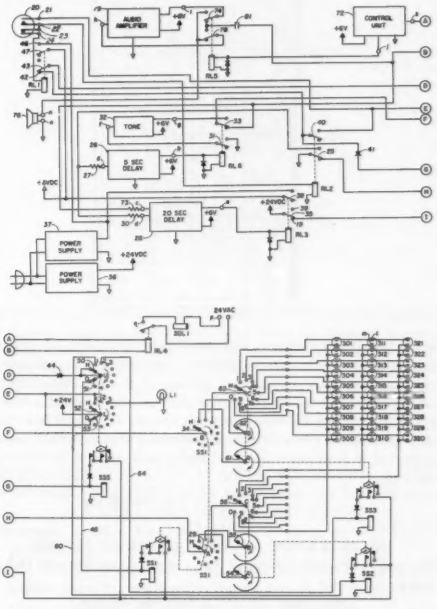
U.S. Cl. 179—37 **10 Claims**

1. An intercommunication security system comprising:

a. electrical power means;

b. selectably energizable switch means connected to said electrical power means producing a series of one or more electrical pulses representative of the digits 0 through 9 each time said selectably energizable switch means is energized;

c. selector stepping switch means connected to said selectably energizable switch means for electrically directing said series of pulses representative of the digits 0 through 9 through contacts in successive order, including means for advancement thereof to a next contact after receiving the last of each of said series of pulses;



d. first stepping switch means connected to said selector stepping switch means and having a switch arm responding to a first series of said pulses;

e. second stepping switch means connected to said first stepping switch means and having a switch arm responding to a second series of said pulses;

f. third stepping switch means connected to said first stepping switch means and having a switch arm responsive to a third series of said pulses;

g. central intercommunication means connected to said first stepping switch means;

h. and a plurality of remote intercommunication means located at remote locations, each of which is connected to said second and third stepping switch means.

3,911,229
MODULAR JACK STRIP ASSEMBLY

Paul V. De Luca, Port Washington; William V. Carney, Valley Stream, and Ronald G. Carevello, Massapequa, all of N.Y., assignors to Porta Systems Corporation, Syosset, N.Y.

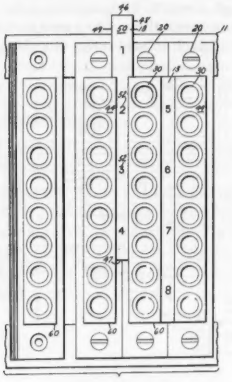
Filed Apr. 15, 1974, Ser. No. 460,696

Int. Cl.[2] H04M *5/02*

U.S. Cl. 179—97 **5 Claims**

1. In a modular jack strip assembly of a type including a plurality of juxtaposed jack strip elements carried by a supporting frame element, each of said jack strip elements including a plurality of jack openings positioned in an exposed wall thereof along a single transversely extending axis, improved means for supporting an identifying indicia for each opening

comprising: an elongated groove-forming member extending outwardly from said wall on each of said jack strip elements, and having a principal axis parallel to said transversely extending axis, said groove-forming member at least partially surrounding at least one of said jack openings and defining an elongated groove parallel to said principal axis along at least one edge thereof; said jack strip elements being so assembled



upon said frame element that an elongaged groove on one of said jack strip elements is disposed opposite a corresponding elongated groove on another of said jack strip elements to define a channel therebetween, and an elongated indicia-bearing strip member slidably insertable into said channel between said grooves to position predetermined indicia thereon adjacent said at least partially surrounded jack opening to identify the same.

3,911,230

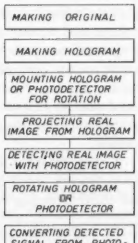
HOLOGRAPHIC REPRODUCTION OF SOUND

Norman S. Neidell, Houston, Tex., assignor to Seiscom Delta, Inc.

Filed May 23, 1970, Ser. No. 40,301

Int. Cl. G11b *7/00*

U.S. Cl. 179—100.3 G **3 Claims**


MAKING ORIGINAL
MAKING HOLOGRAM
MOUNTING HOLOGRAM OR PHOTODETECTOR FOR ROTATION
PROJECTING REAL IMAGE FROM HOLOGRAM
DETECTING REAL IMAGE WITH PHOTODETECTOR
ROTATING HOLOGRAM OR PHOTODETECTOR
CONVERTING DETECTED SIGNAL FROM PHOTO-DETECTOR TO ACOUSTICAL ENERGY

1. The method of reproducing sound from a holographic sound recording, wherein the holographic sound recording is a holographic reproduction of a disk recording having sound preserved thereon by variations in the undulations of the grooves, comprising the steps of

projecting the holographic sound recording to produce a real image,

sensing with a photodetector the projected image to produce electrical impulses related to the holographic sound recording,

spirally rotating the photodetector such that the photodetector moves with respect to the projected image by a one-groove dimension during one rotation of the photodetector, and

converting the electrical impulses from the photodetector to acoustical energy susceptible of being heard.

3,911,231

FOUR-CHANNEL STEREOPHONIC REPRODUCING SYSTEM

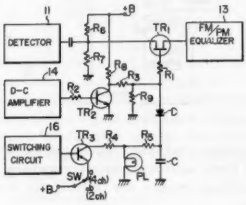
Yukio Sugimoto, Katano; Makoto Okamasa, Kyoto, and Toyoshi Fukumura, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 20, 1974, Ser. No. 471,827

Claims priority, application Japan, May 25, 1973, 48-61936; May 25, 1973, 48-61937

Int. Cl. H04h *5/00*

U.S. Cl. 179—100.4 ST **5 Claims**



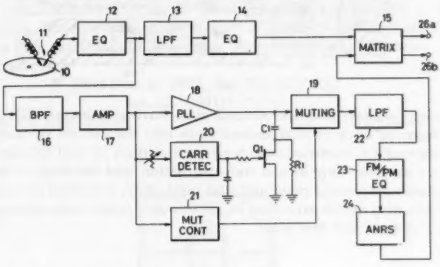
1. A four-channel stereophonic reproducing system for reproducing a CD-4 type four-channel record where a composite signal obtained from a first main channel signal constituted by a sum combination of first and second audio signals and a first sub-channel signal constituted by a frequency or phase modulation of a difference combination of said first and second audio signals on a predetermined sub-carrier is recorded in one sound groove, and also where another composite signal obtained from a second main channel signal constituted by a sum combination of third and fourth audio signals and a second sub-channel signal constituted by a frequency or phase modulation of a difference combination of said third and fourth audio signals on a predetermined sub-carrier is recorded on another sound groove, said system comprising a pick-up for reproducing the stereophonic composite signals from said four-channel record, filter means for separating the first and second main channel signals and first and second sub-channel signals from the reproduced stereophonic composite signals, first and second sub-channel signal processing systems including pulse counter type detector means for detecting the separated first and second sub-channel signals respectively, matrix means for combining the outputs of said detector means and said first and second main channel signals to derive said first, second, third and fourth audio signals, muting circuit means each provided in each of the first and second sub-channel signal processing systems for on-off controlling the passage of each of the first and second sub-channel signals, and muting circuit control means for rendering operative said muting circuit means upon detection of the sub-carrier waves of said first and second sub-channel signals at the time of start of playback of said four-channel record and gradually rendering inoperative said muting circuit means after the detection of said sub-carrier waves.

3,911,232

DEMODULATION SYSTEM FOR ANGLE-MODULATED WAVE PICKED UP FROM A MULTI-CHANNEL RECORD DISC

Yasuo Itoh, Tokyo, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Dec. 28, 1973, Ser. No. 429,114
Claims priority, application Japan, Dec. 29, 1972, 48-1541
Int. Cl.[2] G11B *3/74*; H03D *3/00*
U.S. Cl. 179—100.4 ST 7 Claims



1. A demodulation system comprising:

a phase-locked loop circuit means for demodulating an angle-modulated wave signal picked up from a multi-channel record disc on which a direct-wave signal and the angle-modulated wave signal are superimposed and recorded;

means responsive to said phase-locked loop circuit for setting the loop gain small so that the maximum lock range width of said phase-locked loop circuit falls within the frequency band of said angle-modulated wave signals; and

equalizing means responsive to signals demodulated by said phase-locked loop circuit for reinforcing and compensating for the higher frequency range characteristic of the frequency characteristic of the signals demodulated by said phase-locked loop circuit.

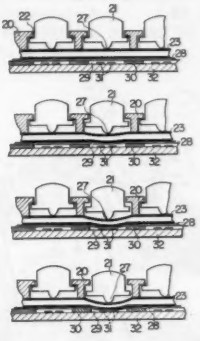
3,911,233

KEYBOARD SWITCH FOR DESK TOP ELECTRONIC CALCULATORS

Shigeo Nakamura, Neyagawa; Yutaka Takano, Katano; Masaki Suzumura, and Keizi Onishi, both of Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 20, 1973, Ser. No. 389,436
Claims priority, application Japan, Feb. 20, 1973, 48-20938; Feb. 20, 1973, 48-22310[U]; Mar. 20, 1973, 48-34067[U]; Mar. 27, 1973, 48-37336[U]; Mar. 29, 1973, 48-38403[U]
Int. Cl.[2] H01H *13/52*
U.S. Cl. 200—5 R 8 Claims

1. A key board switch comprising a key button supporting frame supporting a plurality of key buttons movable vertically, horizontally disposed tubular resilient means positioned under at least two key buttons for interrupting vertical movement of said buttons and urging the same upwardly, printed substrate means positioned having plural pairs of fixed electrodes corresponding to said buttons under said resilient means, conductive resilient sheet means positioned between said resilient means and said substrate means for protecting said electrodes from dirt and dust, insulating spacer means provided between said substrate means and said conductive sheet means and having a thickness and apertures respectively corresponding to said pairs of electrodes for allowing deformations of parts of said sheet means and tubular means through the corresponding apertures to make parts of said conductive resilient sheet means be in contact with the corresponding pairs of fixed electrodes to shortcircuit the same, said key buttons having means for causing by downward actuations thereof said deformations of the conductive resilient sheet means and the tubular resilient means against their resilient forces, said resilient forces enabling the respective means to release said deformations with release of said downward actuation of the key



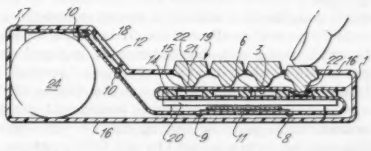
buttons to open the shortcircuited electrodes, and said tubular resilient means having the resilient force for causing a good feeling upon the actuation of said key buttons and absorbing undesired possible actuations to said conductive sheet means other than those caused by the actuations of the key buttons.

3,911,234

KEYBOARD TYPE SWITCH ASSEMBLY HAVING FIXED AND MOVABLE CONTACTS DISPOSED ON FOLDABLE FLEXIBLE PRINTED CIRCUIT BOARD

Yasumasa Kotaka, Kawasaki, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 25, 1974, Ser. No. 483,179
Claims priority, application Japan, July 5, 1973, 48-75944
Int. Cl.[2] H01H *9/00*, *13/02*; H02B *1/04*
U.S. Cl. 200—5 A 4 Claims

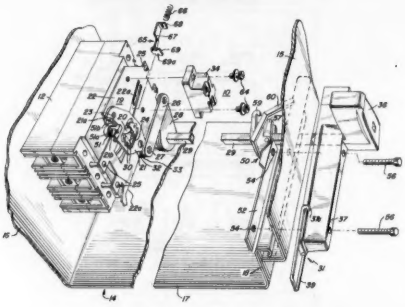


1. A flexible printed circuit matrix switch comprising a flexible printed circuit formed of a flexible insulating lamina having first and second spaced interconnectible contact portions on one surface thereof, the first portion comprising a contact zone and the second portion comprising an array of contact areas disposed in a grid, the lamina being folded about a spacer whereby the first and second contact portions are located on opposite sides of the spacer and are facing each other in opposed complementary relation, a plurality of apertures in said spacer disposed in a grid with the apertures being in alignment with the contact areas of said second contact portion, said first and second contact portions being movable into and out of engagement with each other through a selected one of said apertures by flexure of the flexible printed circuit.

3,911,235
FLANGE MOUNTED OPERATOR FOR AN ENCLOSED ELECTRIC CIRCUIT BREAKER

Donald R. Venzke; James L. Wiseman; Donald Isaac, Jr., all of Cedar Rapids, Iowa, and James H. Leonard, St. Louis, Mo., assignors to Square D Company, Park Ridge, Ill.

Filed Apr. 29, 1974, Ser. No. 465,214
Int. Cl.² H01H *9/20, 33/46*
U.S. Cl. 200—50 A **7 Claims**



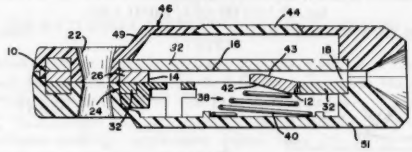
1. An enclosed circuit breaker and external operating mechanism therefor comprising an enclosure having a rear wall opposite a front access opening, a hinged cover for the access opening closeable against a front wall flange defining an edge of the access opening, a molded case circuit breaker mounted on the rear wall and having a front-facing settable operating handle pivotable about an axis between ON and OFF positions, a driving member passing through an opening in the flange and extending inwardly of the enclosure toward the circuit breaker, connecting means associated with the inner end portion of the driving member for movement in a first plane between first and second positions upon rotation of said driving member in opposite directions and connected to the handle of the circuit breaker to move said handle in a plane transverse to said first plane between said ON position when said connecting member is moved to said first position and said OFF position when said connecting member is moved to said second position, an exterior operating handle mounted on the driving member for rotating the operating member and being pivotable between ON and OFF positions corresponding respectively to the ON and OFF positions of the circuit breaker handle, and releasable means interconnecting the pivotally mounted handle and the driving member, said releasable means being movable between an engaged and disengaged position, whereby in said disengaged position the handle may be freely rotated relative to the driving member between said ON and OFF positions, and in said engaged position said handle and said driving member are connected to rotate together between said ON and OFF positions.

3,911,236
LAMINATED BUCKLE HOUSING

Arden Ellis Poulsen, Mount Clemens, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Feb. 12, 1974, Ser. No. 441,912
Int. Cl.² A44B *11/26;* **H01H** *3/16*
U.S. Cl. 200—61.58 B **10 Claims**

1. In a safety belt buckle having a housing therein, said housing having an opening therein, a cavity extending from said opening to a wall of said housing opposite said opening, inlet means communicating with said cavity for receiving the tongue of a seat belt, movable latching means for engaging the tongue, connecting means for connecting the housing to the seat belt, and manually operable actuation means for actuating said latching means, the improvement wherein said housing is formed of at least three laminated plates in contact with one another and secured together, said laminated plates including a first plate, a second plate, and a third plate, said second plate disposed between said first plate and said third plate, each of said plates having an opening in the central portion thereof, said openings in substantial alignment with

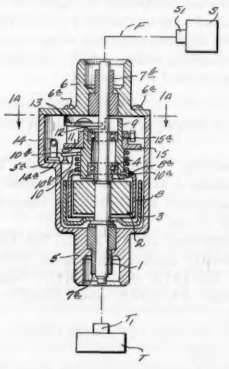


one another, and said second plate having a slot extending from an edge of said second plate into the central opening thereof for receiving said tongue, a portion of said latching means extending in and movable within said openings of at least said second plate and said third plate, a portion of said actuating means extending in and movable within said opening of at least said first plate.

3,911,237
ROTATING SPEED DETECTING DEVICE

Michikatsu Naito, Nagoya; Kenji Yamada, Anjo, and Yasuhiro Yamamoto, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

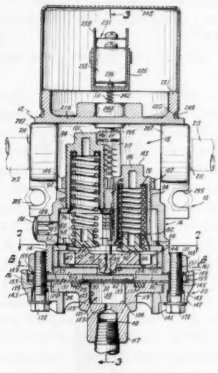
Filed Jan. 31, 1974, Ser. No. 438,260
Claims priority, application Japan, Mar. 27, 1973, 48-35390
Int. Cl.² G01P *15/00;* **H01H** *35/14*
U.S. Cl. 200—61.46 **7 Claims**



1. A rotating speed detecting device for use with a speed meter comprising;
a housing (**5**);
a rotary shaft (**1**) connected to a transmission at one end thereof and rotatably mounted in said housing;
the other end of said rotary shaft being connected to said speed meter,
a round permanent magnet (**2**) secured on said rotary shaft;
a rotor (**8**) made of nonmagnetic and conductive material and enclosing said room permanent magnet;
and a coil spring (**10**) hung on said housing at one end thereof and on said rotor at the other end for biasing said rotor against the rotation,
wherein the improvement comprises;
a bearing case (**9**) rotatably mounted on said rotary shaft and on which said rotor is secured;

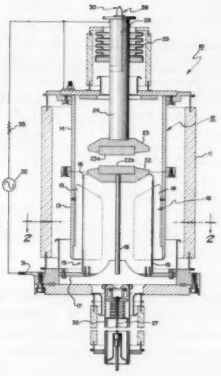
another permanent magnet (**16**) secured to said bearing case to be rotated therewith;
a groove (**12**) provided at said bearing case;
a stopper means (**13**) mounted on said housing and engaging with said groove; and
a reed switch means mounted on said housing.

3,911,238
CONDITION RESPONSIVE CONTROL DEVICE WITH CAPACITY FOR INDEPENDENT ADJUSTMENT OF CONTROL POINTS AND TRANSDUCER THEREFOR
Noel A. Otto, Whippany, and Roger G. Riefler, Kinnelon, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.
Filed Dec. 6, 1973, Ser. No. 422,432
Int. Cl.[2] H01H *35/34*
U.S. Cl. 200—83 S **22 Claims**



1. A control device comprising:
a. a housing;
b. a chamber in said housing;
c. a sensing means defining at least part of said chamber, said sensing means being displaceable through a stroke;
d. a balance means, said sensing means being operatively connected to said balance means;
e. a pair of bosses on one side of said balance means, one boss extending a greater distance from said one side than the other boss;
f. stop means cooperating with said balance means defining a pair of axes about which said balance means pivots;
g. first and second biasing means each of which is connected with one of said bosses;
h. adjusting means coupled with said biasing means, said adjusting means including an interlock means preventing said first biasing means from being adjusted to exert a biasing force greater than that of said second biasing means,
i. a control means operatively coupled to said balance means, said control means including means shiftable between two control modes;
j. whereby displacement of said sensing means through one part of its stroke effects both pivoting of said balance means about said first axis and shifting of said control means into one mode, and movement of said sensing means through another part of its stroke effects both pivoting of said balance means about the other axis and shifting of said control means into the other mode, whereby adjustment of said biasing means effects independent adjustment of said control modes, and whereby said bosses facilitate full adjustability of said biasing means and control modes.

3,911,239
VACUUM ARC DEVICES WITH NON-WELDING CONTACTS
James M. Lafferty, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Mar. 28, 1974, Ser. No. 455,735
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **6 Claims**

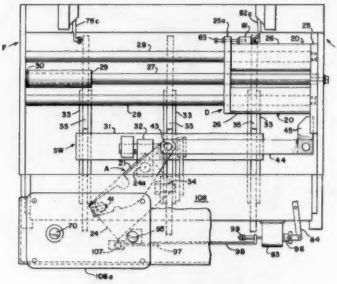


1. A triggerable vacuum gap discharge device comprising:
an hermetically sealed envelope;
a hollow cylindrical member within said envelope;
a first arc-electrode assembly centrally located within said cylindrical member and including a plurality of thin, substantially planar vanes projecting outwardly therefrom;
a second arc-electrode assembly surrounding said first assembly and including a plurality of thin, substantially planar vanes projecting inwardly and supported by said cylindrical member, the vanes of said first and second electrode assemblies being interleaved alternately between one another to define a plurality of electrically-parallel gaps between said assemblies to cause electrical breakdown and arcing between said electrode assemblies to occur simultaneously at a multiplicity of points;
a stationary electrical contact connected to one end of said first arc electrode assembly;
a movable electrical contact, movable into and out of engagement with said stationary contact;
means for injecting a concentration of charged conduction carriers into the electrically parallel gaps to cause electrical breakdown and arcing between said electrode assemblies; and
means for connecting said electrode assemblies and said electrical contacts in an electrical circuit.

3,911,240
DUAL SPRING LOAD BREAK SWITCH
Louis S. Henderson, Lafayette Hill, and Gustav E. Lachman, Levittown, both of Pa., assignors to Pringle Electrical Manufacturing Company, Fort Washington, Pa.
Filed Jan. 18, 1974, Ser. No. 434,478
Int. Cl.[2] H01H *3/30*
U.S. Cl. 200—153 SC **13 Claims**

1. An actuating mechanism for a load break switch having contacts movable into and out of engagement comprising a frame, a loading member, means pivotally mounting the load-

ing member on the frame, an opening cam rotatably mounted on the frame, a first energy-storing member for storing energy in response to movement of the opening cam in a first direction, means coactive between the opening cam and the loading member for moving the opening cam in said first direction in response to movement of the loading member in a first direction, latch means for holding the first energy-storing member in an energy-storing condition, a closing cam rotatably mounted on the frame, a second energy-storing member in engagement with the closing cam, releasable latch means coactive between the loading member and the closing cam for



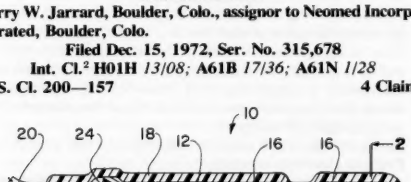
moving the closing cam in a first direction in response to movement of the loading member in a second direction, a switch-operating means rotatably mounted on the frame for opening and closing the contacts of the switch, release means for releasing the releasable latch means after the closing cam has actuated the second energy-storing member to store energy therein, means carried by the switch operating means for engaging the closing cam as it is driven by the second energy-storing member means for releasing the first-mentioned latch means, and means carried by the operating means for engaging the opening cam as it is driven by the first energy-storing member.

3,911,241

SWITCHING DEVICE FOR ELECTRO-SURGICAL INSTRUMENTS

Jerry W. Jarrard, Boulder, Colo., assignor to Neomed Incorporated, Boulder, Colo.

Filed Dec. 15, 1972, Ser. No. 315,678
Int. Cl.[2] H01H *13/08;* **A61B** *17/36;* **A61N** *1/28*
U.S. Cl. 200—157 **4 Claims**



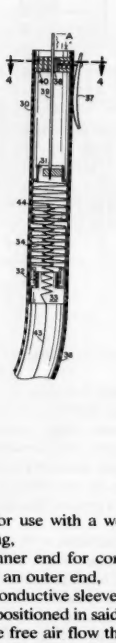
1. A hand-actuated device for controlling the transmission of electrical current between an electro-surgical generator and a surgical electrode comprising in combination a body portion with a conductive socket for releasable retention of a surgical electrode, said body portion including means for mounting a dual switch assembly for effecting selected transmission of electrical current from an electro-surgical generator to the conductive socket, said dual switch comprising first and second electrically conductive actuating elements, spaced electric insulating sleeves around each of said actuating elements, actuating gaps between said insulating sleeves in which the actuating elements are exposed, an electrically conductive contact element adjacent to said insulating sleeves and slightly spaced from said actuating elements, said actuating elements movable to become temporarily engaged with said contact element in said actuation gaps, electrical leads connecting each of said actuation elements, said contact element, and said socket to an electro-surgical generator, pushbutton means including a pair of generally tubular guides in alignment with said actuating gaps and pushbuttons in said guides disposed for sliding movement therein to cause the aligned actuating element to move into engagement with said contact element, and a flexible covering around the body portion of the device including means covering said pushbutton means whereby pressure applied through said covering means against said pushbutton means will force said pushbutton means against the aligned actuating element causing it to move into contact with said contact element.

3,911,242

ANTI-SMOG ELECTRICAL WELDING APPARATUS AND MULTIPLE ENERGY SUPPLY CONDUIT

Virgil G. Strang, P.O. Box 772, Renton, Wash. 98055

Continuation of Ser. No. 73,367, Sept. 18, 1970, abandoned.
This application Mar. 8, 1974, Ser. No. 449,378
Int. Cl. B23k *9/00*
U.S. Cl. 219—130 **14 Claims**



1. A welding device for use with a welding console, said welding device comprising,

a conduit having an inner end for communication with a welding console and an outer end,

a slidable electrically conductive sleeve member concentrically and abuttingly positioned in said conduit and having open ends to provide free air flow therethrough,

an electrode in said conduit in spaced relationship with said conduit, extending from said slidable sleeve member out said outer end of said conduit, attached to said sleeve member, and being movable with said slidable sleeve member,

a stationary sleeve member concentrically and abuttingly positioned in said conduit nearer the inner end thereof than is said slidable sleeve member, likewise having open ends to provide free air flow therethrough,

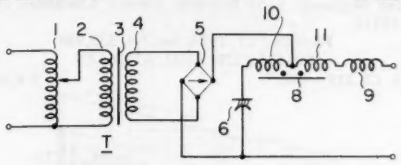
means extending from said stationary sleeve member to said slidable sleeve member to yieldably urge said slidable sleeve member and said electrode toward said outer end of said conduit, and

an electrical conduction means within said conduit to convey electrical energy from said console to said electrode.

3,911,243
WELDING POWER SOURCE

Norio Moriyama, and Yasuzo Tsuchiya, both of Takarazuka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 24, 1974, Ser. No. 463,505
Claims priority, application Japan, Apr. 26, 1973, 48-47868
Int. Cl.² B23K *9/10*
U.S. Cl. 219—135 2 Claims



1. A power supply for providing power to an arc welding load comprising:

a welding transformer having primary and secondary wingings,

a rectifier having input and output terminals, said input terminals being connected to said secondary winding,

a first reactor including first and second series-connected windings wound on a core having a closed magnetic path structure, said first and second windings being wound so that the magnetic flux produced by said first winding cancels the magnetic flux produced by said second winding, said first reactor having a relatively large coupling factor due to said closed magnetic path, the inductance of each of said first and second windings being relatively large and the net inductance of said first and second winings being relatively small,

means coupling the junction of said first and second windings to an output terminal of said rectifier,

a capacitor connected between the first winding of said first reactor and the other output terminal of said rectifier, and

a second reactor having an open magnetic path structure and first and second terminals, the first terminal of said second reactor being coupled to the second winding of said first reactor, an arc being generated between the second terminal of said capacitor and the other output terminal of said rectifier, said power supply providing a relatively smooth output and rapid response to current changes with changes in said load.

3,911,244
ELECTRODE COMPOSITION AND WELDING METHOD FOR ARC WELDING STEEL

Hajime Nakamura, Tokyo, and Ichiro Ohta, Yokohama, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 270,427, July 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 55,794, July 17, 1970, abandoned. This application Apr. 18, 1974, Ser. No. 462,170
Claims priority, application Japan, Sept. 13, 1969, 44-73024
Int. Cl.² B23K *35/24, 35/362*
U.S. Cl. 219—146 3 Claims

1. A wire electrode for use in arc welding comprising a metal to be deposited on a substrate and further comprising a flux, said flux comprising:

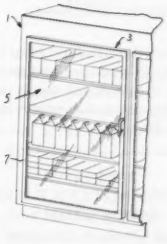
1. Magnesium-aluminum alloy having aluminum content of 20 to 80 percent, said alloy present in said flux in the amount of 5 to 35 percent by weight;
2. CaF_2 present in said flux in an amount of 30 to 80 percent, based upon the weight of said flux;
3. Hematite present in said flux in an amount of 3 to 30 percent by weight;
4. Silicon and/or manganese in a combined amount less than 10 percent by weight, based upon the weight of said flux;
5. Titanium in the amount of less than 1.00 weight percent, based upon the weight of said flux;
6. Zirconium present in said flux in an amount of 0.005 to 0.200 percent, based on the weight of said flux; and
7. Boron in an amount less than 0.060 percent by weight, based upon the weight of said flux,

said flux being from 10 to 40 percent by weight of the weight of said wire electrode.

3,911,245
HEATED MULTIPLE-PANE GLASS UNITS

Roger D. O'Shaughnessy, Minneapolis, Minn., assignor to Cardinal Insulated Glass Co., Minneapolis, Minn.

Filed Apr. 15, 1974, Ser. No. 460,979
Int. Cl.² H05B *1/00, 3/26*
U.S. Cl. 219—218 12 Claims



1. A multiple-pane glass unit comprising:

at least first and second glass panes in aligned, face-to-face relationship;

electrically insulating spacing material perimeterly disposed between said first and second glass panes to provide a confined space between said first and second glass panes, said space being of a width no more than about 2 mm.;

first and second electrodes in parallel relationship adherably bonded to one of the opposing faces of said first and second glass panes; and

an electrically conductive coating adherably bonded to said face having said first and second electrodes between said first and second electrodes, said coating providing an electrically conductive path between said first and second electrodes.

3,911,246
ELECTRODE ASSEMBLY FOR A RESISTANCE SOLDERING UNIT

John H. Drinkard, Jr., 122 N. Valley Road, Exton, Pa. 19341

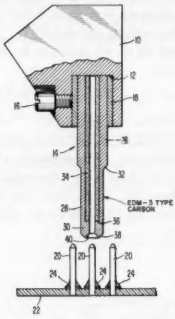
Filed Jan. 17, 1974, Ser. No. 434,071
Int. Cl.² H05B *1/00;* B23K *1/02, 3/02, 11/30*
U.S. Cl. 219—234 2 Claims

1. An electrode assembly for a resistance soldering unit for use in soldering fine pins to a backplane structure of a computer, comprising:

a hollow open-ended cylindrical electrode of carbon having substantially a scope score hardness of 70 and a density of 1.88 grms/cm with impurity of 5 parts per million or less and particle size of less than 0.001 inches, said electrode including a tip portion, a shank portion extending from said tip portion, a base portion extending from said shank portion, said base portion being of greater outer diameter than said shank and tip portions, the hollow of said electrode comprising a multi-diameter cylindrical cavity coaxially formed in said electrode tip, shank and

base portions whereby the inside diameter of said base and shank portions is greater than the inside diameter of said tip portion, said tip portion being adapted to receive a pin to be soldered;

collet means interposing said base portion and the soldering unit for securing said base portion to the soldering unit and for providing an electrical path therebetween; and



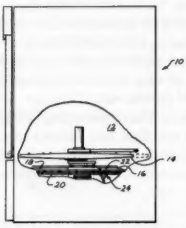
a hollow open-ended cylindrical insulator inserted coextensively in the cavity in said base and shank portions, said insulator having a cylindrical cavity coaxially formed therein substantially equal in diameter to the inside diameter of said tip portion.

3,911,247

THERMOSTAT MOUNTING DEVICE FOR PLASTIC TUB DISHWASHER

Richard A. Rowe, Fern Creek, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 30, 1974, Ser. No. 519,332
Int. Cl.[2] F24H *1/00*
U.S. Cl. 219—328 **4 Claims**



1. A dishwasher of the type comprising a tub and a door defining a wash chamber; means for supplying heat to the wash chamber; a thermostat for deenergizing the heating means in response to a predetermined temperature in the wash chamber; and mounting means mounting the thermostat in heat-exchange relationship to the wash chamber, the improvement wherein: the tub is supported by exterior support means and includes an imperforate wall section having an interior surface exposed to the wash chamber and an exterior surface;

the thermostat including: a body having a peripherally extending portion adjacent one end, projecting outwardly past the periphery of the thermostat body; and electrical terminals adjacent the other end;

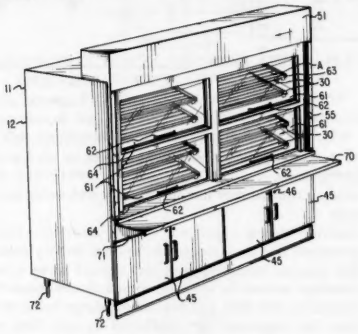
the thermostat-mounting means including: an exteriorly-threaded receptacle screwed into said tub support means, said receptacle having a cavity therein receiving the thermostat body; a skirt member peripherally attached at one end and extending outwardly therefrom to shield the electrical terminals of said thermostat; and a peripheral edge engaging the underside of said peripherally extending portion to urge the thermostat into heat-transfer relation with the exterior surface of the tub.

3,911,248

HOT FOOD MERCHANDISER

Eugene Buday, 324 Sunset Drive, Pittsburgh, Pa. 15235, and Sol Blackman, 1152 Fowanda Terrace, Cincinnati, Ohio 45216

Filed Dec. 23, 1974, Ser. No. 535,968
Int. Cl.[2] F27D *11/02;* **A21B** *1/00*
U.S. Cl. 219—400 **6 Claims**



1. A hot food merchandiser comprising:

a. a cabinet;

b. a food compartment placed within the upper portion of the cabinet;

c. a heating compartment placed within the cabinet and below the food compartment;

d. a storage compartment placed within the cabinet and below the heating compartment;

e. an inside wall placed around the heating compartment and storage compartment;

f. insulation placed around the inside wall;

g. a duct wall situated around the sides and top of the food compartment whereby an annular space, dimensioned to permit the flow of air, results between the duct wall and the inside wall;

h. an electric fin heater placed within the heating compartment;

i. a blower situated in the heating compartment so that air is blown over the fin heater;

j. baffles placed within the annular space and the heating compartment whereby air is focused to travel into and through the annular space;

k. a grill rack designed for the attractive display and dispensing of hot food items and placed within the food compartment;

l. an access door attached to the cabinet and the food compartment; and

m. connection means for opening the access door whereby it opens up and into the cabinet so that the door does not limit access to the grill rack and food compartment.

3,911,249

DEEP FAT FRYER WITH MELT CONTROL

Richard T. Keating, 715 S. 25th Ave., Bellwood, Chicago, Ill. 60104

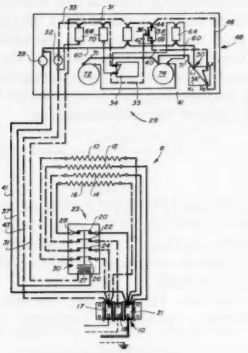
Filed May 13, 1974, Ser. No. 469,386
Int. Cl.[2] F27D *11/02*
U.S. Cl. 219—441 **3 Claims**

1. A controlled melt system for a deep fat fryer having an open top vessel with electrically-heated heat transfer tubes therein contacted by packed solidified fat and including elec-

trical control means for a controlled melt during startup comprising:

a. a 120–240 volts of A.C. electrical power;

b. a power circuit comprising a plurality of heating elements connected to the source; and



c. a control circuit including a periodically actuated time delay means connected between the power circuit and the source for supplying intermittent pulses each made up of a plurality of full line voltage half-cycle A.C. power waves to the heating elements whereby the heating tube is prevented from overheating and solid fat packed therein melts without burning during startup.

3,911,250

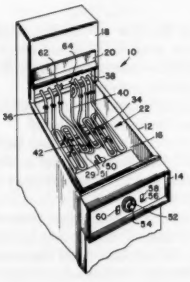
FRYING APPARATUS WITH COMPENSATED THERMOSTAT

George M. Price, Shreveport, La., assignor to The Frymaster Corporation, Shreveport, La.

Filed May 1, 1974, Ser. No. 465,918

Int. Cl.[2] **F27D** *11/02;* **A47J** *37/12*

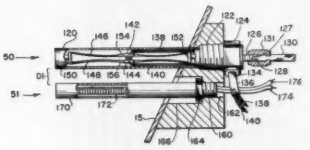
U.S. Cl. 219—442 **7 Claims**



1. In frying apparatus having electrically operated heating elements disposed in a cooking basin to heat fluid in said basin for deep fat frying, the combination comprising:

adjustable thermal control means in electrical communication with said heating elements and disposed in said basin spaced separate from said heating elements for regulating the temperature of said fluid by controlling said heating elements, and

heating means in electrical communication with said heating elements and adjacent said thermal control means for heating said thermal control means to the temperature simulate said heating elements being adjacent said thermal control means, whereby said fluid is maintained substantially at a predetermined temperature by said thermal control means.



3,911,251

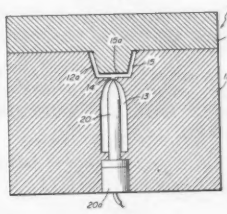
HEATING DEVICE FOR MOLDING

Charles L. Day, R.F.D., Kennebunk, Maine 04043

Filed Nov. 5, 1973, Ser. No. 412,699

Int. Cl.[2] **H05B** *3/54;* **B29F** *1/08*

U.S. Cl. 219—523 **1 Claim**



1. A heating device (**20**) for use inside a molding channel (**13**) for plastics and the like comprising in combination:

a. an elongated hollow conductive body (**24**) having a tapering forward end;

b. electrical heating means (**29**) within said body (**24**) and in heat-conductive contact therewith;

c. a heat-isolation tube (**28**) within and coextensive with said heating means (**29**) so as to define a central cavity;

d. a probe tube (**25**) extending through said cavity to said body forward end and being spaced away from the walls of said isolation tube (**28**);

e. heat-responsive electrical element (**41**) at the forward end of said probe tube (**25**) having conductors (**30**) extending through said probe tube (**25**) to means adapted to connect to a control circuit (**40**) for said heating means: and

f. a heat-conductive member (**21**) which seals off the forward end of said body (**26**) and tube (**28**), is in direct contact with said heat-responsive element (**41**), and protrudes so as to be capable of direct contact with molten plastic in the channel (**13**).

3,911,252
TOKEN READER

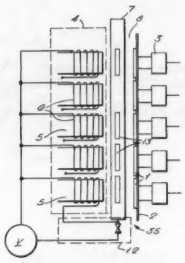
Svend Scheel Meyer, Gloucestershire, England, assignor to Group 4 Total Security Limited, Worcestershire, England

Filed Dec. 26, 1973, Ser. No. 428,900

Claims priority, application United Kingdom, Dec. 29, 1972, 60182/72

Int. Cl. G06k *7/08*

U.S. Cl. 235—61.11 D **11 Claims**



1. A token reader comprising:

means for producing a dynamic magnetic field;

an array of coils, each constituted by a substantially planar spiral of conductive material arranged on a substantially planar insulative support, for producing respective signals in response to changes in the said field; and

a receiving zone for receiving a token having magnetic field affecting means for reducing the magnetic coupling between the field producing means and certain ones of the coils in dependence upon the arrangement of the magnetic field affecting means, whereby, when such a token is in said zone, the signals produced by the respective coils correspond to the arrangement of the magnetic field affecting means of the token.

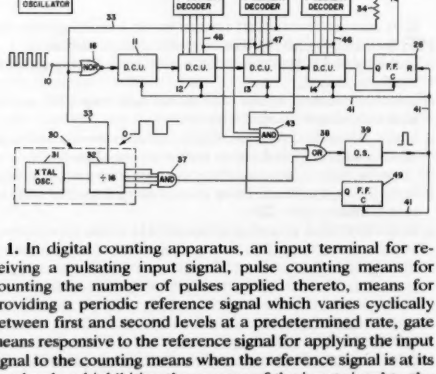
3,911,253
DIGITAL COUNTING METHOD AND APPARATUS

David N. Torresdal, 427 Hillcrest Way, Redwood City, Calif. 94082

Continuation-in-part of Ser. No. 218,984, Jan. 19, 1972, abandoned. This application Sept. 10, 1973, Ser. No. 395,507

Int. Cl.[2] H03K *21/30*; **G01R** *23/02*

U.S. Cl. 235—92 FQ **4 Claims**



1. In digital counting apparatus, an input terminal for receiving a pulsating input signal, pulse counting means for counting the number of pulses applied thereto, means for providing a periodic reference signal which varies cyclically between first and second levels at a predetermined rate, gate means responsive to the reference signal for applying the input signal to the counting means when the reference signal is at its first level and inhibiting the passage of the input signal to the counting means when the reference signal is at its second level, digital display means, output lines carrying signals representing the count registered by the counting means, means responsive to the reference signal for conditioning the display means to display the count represented by the signals on the output lines when the reference signal is at its second level, additional counting means and additional gate means for diverting the input signal from the first named counting means to the additional counting means when the reference signal is at its first level until the count in the additional counting means reaches a predetermined level and thereafter applying the input signal to the first named counting means, and means for resetting the counting means to its initial level toward the end of each cycle of the reference signal.

3,911,254
METHOD AND AN APPARATUS FOR AUTOMATICALLY ADDING CYCLES WITH VARYING RATINGS

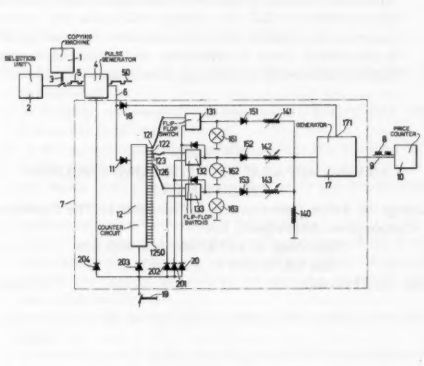
Klaus Leibrecht, Hofheim, Taunus, and Helmut Jahn, Frankfurt Main-Hausen, Germany, assignors to Kalle Aktiengesellschaft, Germany

Filed Oct. 11, 1973, Ser. No. 405,541

Claims priority, application Germany, Oct. 16, 1972, 2250632

Int. Cl.[2] G06B *27/06*

U.S. Cl. 235—92 PD **12 Claims**



1. An apparatus for the automatic addition of machine cycles in a sequence, wherein different machine cycles in said sequence have different ratings, said apparatus comprising:

a. a machine cycle transmitter;

b. first pulse generator means coupled to said machine cycle transmitter and responsive thereto;

c. first counter means coupled to said first pulse generator means, said counter means having a plurality of outputs, each output corresponding to a number in the count cycle of said counter;

d. rating circuit means coupled to at least two of the outputs of said counter means, said rating circuit means producing a plurality of outputs, each output corresponding to one of said different ratings wherein the one of said plurality of outputs which is produced is a function of the count in said first counter means;

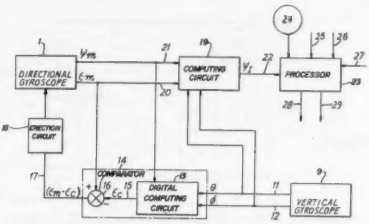
e. second pulse generator means having a first input coupled to said rating circuit means said second pulse generator means producing a pulse output having a frequency corresponding to the output of said rating circuit means; and

f. second counter means for counting the pulses in the output of said second pulse generator means.

3,911,255
COMPASS SYSTEMS

David Mason Dewar, Wokingham, and Peter Dosell Finch, Woking, both of England, assignors to Sperry Rand Corporation, New York, N.Y.

Filed July 11, 1974, Ser. No. 487,485
Claims priority, application United Kingdom, July 20, 1973, 34607/73
Int. Cl.[2] G06G 7/78; G01C 19/34
U.S. Cl. 235—150.25 10 Claims



1. A compass system for a vehicle comprising

a two-degree-of-freedom directional gyroscope having inner and outer gimbals and operable to produce an electrical output signal representative of the heading of the vehicle in which the compass system is fitted,

vertical reference means operable to provide an output signal representative of the pitch and/or roll of the vehicle,

computer means to derive from the output signals of the directional gyroscope and the vertical reference means a signal representative of the angle between the inner and outer gimbals of the directional gyroscope which would exist if the plane of the inner gimbal were parallel to the Earth's horizontal axis,

a pick-off means operable to measure the true angle between the inner and outer gimbals of the directional gyroscope,

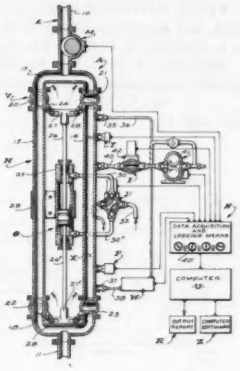
comparator means operable to compare the signal from the computer means with the signal from the pick-off means to provide an output signal representative of the error in the angle between the inner and outer gimbals of the directional gyroscope, the error signal being applied to an erection system forming part of the directional gyroscope to adjust the plane of the inner gimbal substantially parallel to the Earth's horizontal axis.

3,911,256
APPARATUS FOR TESTING AND ANALYZING FLUID MIXTURE

Ray L. Jones, 258 Paseo de Granada, Redondo Beach, Calif. 90277

Filed Dec. 19, 1973, Ser. No. 426,332
Int. Cl.[2] G01N 7/10
U.S. Cl. 235—151.3 10 Claims

1. An apparatus for acquisition of data for use in calculating the net volume of gas, oil and water in crude oil comprising an elongate vertical first pipe defining a sample chamber of predetermined volumetric extent, a second pipe equal in volumetric extent with the chamber defined by the first pipe, valve means at each end of the pipes and communicating with spaced sections of a crude oil flow line, operating means for the valve means to open and close communication between the flow line sections and the pipes to selectively direct crude oil into and through the second pipe or into and through the first pipe and chamber defined thereby, fluid displacement means connected with the first pipe communicating with the chamber and operable to selectively displace crude oil in the chamber a predetermined volumetric extent when the chamber is closed by said valve means and to thereby compress gas in and carried by the crude oil and to change the pressure on the crude oil in the chamber, pressure sensing and indicating means communicating with the chamber to indicate pressure data on the crude oil therein before and after the displacement means is operated, temperature sensing and indicating means

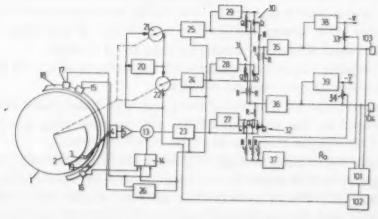


communicating with the chamber to indicate temperature data of the crude oil therein before and after the displacement means is operated and fluid weighing means communicating with the chamber to weigh and indicate the weight of the crude oil in the chamber before and after the displacement means is operated.

3,911,257
INSTRUMENT FOR MEASURING CURVED SURFACE VARIATIONS

David John Whitehouse, Melton Mowbra; Philip Ross Bellwood, Arthingworth, and Derek Gordon Chetwynd, Wigston, all of England, assignors to The Rank Organisation Limited, London, England

Filed May 23, 1974, Ser. No. 472,724
Claims priority, application United Kingdom, May 23, 1973, 24748/73
Int. Cl.[2] G01B 5/28, 5/00
U.S. Cl. 235—151.3 26 Claims



1. A method of testing a body having at least a part-circular surface, comprising the steps of:

traversing a sensor over a limited arc, less than a full circle, of said surface by effecting relative rotation between said body and said sensor about a centre of relative rotation;

providing from said sensor amplified signals representative of the profile of the surface thereof,

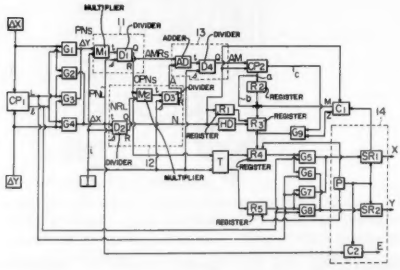
providing signals representative of the relative angular orientation of said body and said sensor, and

conbining said sensor signals with said angular orientation signals to provide an output signal representative of a reference curve centred at the centre of said at least partcircular surface of said body.

3,911,258
PULSE INTERPOLATION SYSTEM

Hajimu Kishi, and Kazushige Momo, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed June 3, 1974, Ser. No. 475,852
Claims priority, application Japan, June 5, 1973, 48-62595
Int. Cl.² G06F *15/46*
U.S. Cl. 235—151.11 **2 Claims**



1. A pulse interpolation system comprising:

a. a first arithmetic means having a first multiplier for the multiplication i times PNs, and a first divider for the division of the product (*i*xPNs) of said multiplication by PN_L, where i is an integer representing a number of pulses to be interpolated in one operational cycle, PNs is an integer representing an incremental command for the axis other than that having the largest incremental command, and PN_L is an integer representing the largest incremental command;

b. a second arithmetic means having a second divider for the division PN_L/i,

a second multiplier for the multiplication OPNs times NR_L, and a third divider for the division of the product of said second multiplier by *i*, where OPNs is a quotient of said first divider and NR_L is a remainder of said second divider;

c. a third arithmetic means having an adder for AMRs plus A, and a fourth divider for the division of the sum of said adder by *i*, where AMRs is a remainder of said first divider and A is a remainder of said third divider;

d. a variable capacity register with capacity N where N is a quotient of said second divider;

e. a converter for obtaining the particular basic pulse train defined by the value of OPNs, and for changing a value of *i* to a pulse train having one in all bit places;

f. means for adding a value of AM in said variable capacity register if N is equal to or larger than AM, and adding a value of (AM-1) in the same if N is smaller than AM, where AM is a quotient of said fourth divider, and N is a quotient of said second divider;

g. means for modifying said basic pulse train by inserting a pulse in said basic pulse train according to an overflow pulse from said variable capacity register due to said addition;

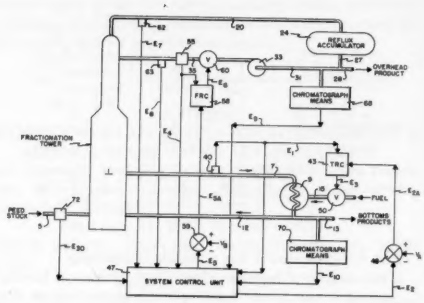
h. means for providing said modified pulse train to the related axis and a pulse train having one in all bit places to the axis of the largest incremental command, and;

i. counter for counting the output interpolation pulses for terminating the operation of the present system.

3,911,259
MEANS FOR CONTROLLING THE REFLUX RATE AND THE REBOILER TEMPERATURE OF A TOWER

Dennis Huddleston, Norwalk, Conn., and Robert J. Kale, Charlotte, N.C., assignors to Texaco Inc., New York, N.Y.

Filed Apr. 11, 1974, Ser. No. 460,242
Int. Cl.² B01D *3/42*; **G06G** *7/58*
U.S. Cl. 235—151.12 **8 Claims**



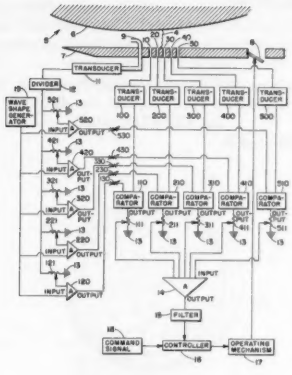
1. A system for controlling a tower which receives feedstock at a predetermined flow rate, and provides an overhead product, a portion of which is fed back to said tower at some external reflux rate and also provides a bottom product, a portion of which is fed back to said tower, comprising means for sensing the temperatures of the overhead product leaving the tower and of the feedback portion of the bottom product, means for sensing the flow rate of the feedstock and the external reflux rate, means for providing signals corresponding to the impurities contained in the overhead product and bottom product, and means connected to the sensing means and to the impurities signal means for controlling the external reflux rate of that portion of overhead product being returned to the tower and for controlling the temperature of the bottom product in accordance with the temperature signals, the flow rate and external reflux rate signals and the impurities signals, said control means includes first storing means for providing signals corresponding to the sensed impurities of the bottom products and the overhead product for a next two previous operation steps, second storing means for providing signals corresponding to an internal reflux rate, the external reflux rate, the overhead tower vapor temperature, reflux rate signal means connected to all the sensing means and to all the storing means for providing a signal corresponding to a determined target external reflux rate in accordance with the signals from the sensing means and the storing means, temperature means connected to all the sensing means and to all the storing means for providing a signal corrsponding to a determined target temperature for the bottom products in accordance with the signals from the sensing means and the storing means, means for providing signals corresponding to a desired target external reflux rate and to a desired target temperature, means connected to the desired target signal means and to the determined target external reflux rate signal means for controlling the external reflux rate signals, means connected to the desired target signal means and to the determined target temperature signal means for controlling the temperature of the bottom products in accordance with the desired and the determined target temperature signals and program means connected to the determined target external reflux rate signal means, to the temperature signal means, to the external reflux rate control means and to the bottom products temperature control means for controlling the operation of the control system.

3,911,260

SHOCK POSITION SENSOR FOR SUPERSONIC INLETS

Miles O. Dustin, North Olmsted, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed May 30, 1974, Ser. No. 474,744
Int. Cl.[2] G06G 7/57; F02K 11/00
U.S. Cl. 235—151.34 **14 Claims**



1. A shock position sensor for a supersonic air inlet having a centerbody disposed in a cowling to form a throat and having a by-pass valve controlled by a controller in response to a control signal and comprising:

means for generating a signal indicative of the total throat pressure of the air inlet;

means for generating at least one signal representative of the static pressure at a point in the throat of the air inlet; means for adding a periodic, time-wise varying scan signal to said signal representative of total throat pressure to produce a composite signal;

means for comparing said signal representative of the static pressure at a point in the inlet throat to said composite signal to produce a pulse-width modulated signal; and

means for averaging said pulse width modulated signal to produce a control signal.

3,911,261

PARITY PREDICTION AND CHECKING NETWORK

Jordan M. Taylor, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,605
Int. Cl.[2] G06F 11/10
U.S. Cl. 235—153 AP **9 Claims**

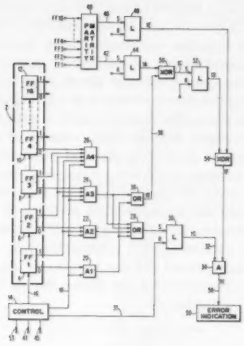
1. In a parity checking circuit the combination comprising: an N stage register;

a parity generation circuit responsive to the binary state of said register for providing a parity signal;

means for storing a check parity signal indicative of the time period within which the parity of said register may be checked, prior to a ONE being applied to a given one of the N stages of said register, in response to sampling said given one of the N stages through a Kth stage of said register, where $K < N$;

means for providing a predicted parity signal in response to comparing said parity signal, prior to said ONE being applied to said given one of the N stages, with a change parity signal provided in response to sampling at least certain ones of said given one of the N stages through said Kth stage;

means for comparing said parity signal and said predicted parity signal for providing an error signal whenever there is a lack of comparison; and



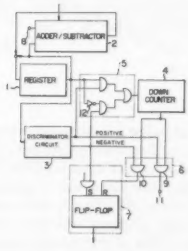
means for comparing said error signal with the stored check parity signal for indicating an error in parity in response to said error signal being provided concurrent with said check parity signal being stored.

3,911,262

DECIMAL POINT DISPLAY CIRCUIT

Yoshihiro Izumi, Suita, and Tatsuo Kawasaki, Takatsuki, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

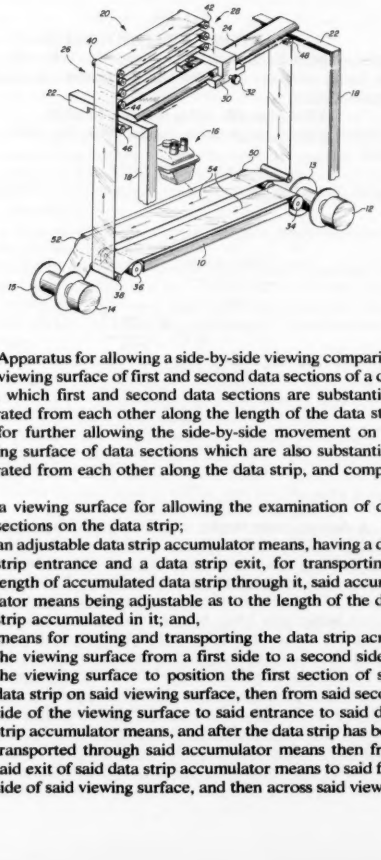
Filed Mar. 18, 1974, Ser. No. 452,393
Claims priority, application Japan, Mar. 20, 1973, 48-32424
Int. Cl.[2] G06K 15/18
U.S. Cl. 235—156 **4 Claims**



1. A decimal point display circuit for use with a numerical display capable of displaying a predetermined number of digits defining a number comprising, an adder/subtractor; a register connected to said adder/subtractor for storing the decimal point location of said number, the contents of said register being zero when the decimal point location being indicated is at the most right-hand digit of the digits displayed on said numerical display, greater than zero when the decimal point location is displaced to the left of said most right-hand digit and less than zero when the decimal point location is displaced to the right of the most right-hand digit; a down counter, the contents of said down counter being decreased in response to a digit timing signal; a control circuit for coupling said down counter to said register and supplying said down counter selectively with the contents or inverted contents of

said register; a discriminator circuit coupled to the output of said register and having positive and negative output terminals to respectively develop outputs representing positive and negative operational signs corresponding to the location of said decimal point; and first and second AND gate circuits each having first and second inputs, the first inputs of said first and second AND gate circuits being connected respectively to the positive and negative terminals of said discriminator circuit and the second inputs of said AND gate circuits being connected to the output of said down counter, said down counter receiving the direct contents of said register when the number of digits above the decimal point is within said predetermined number and the inverted content of said register when the number of digits exceeds said predetermined number, said down counter generating a decimal point indicating signal when the contents thereof becomes zero, the outputs of said AND gate circuits indicating the position of said decimal point and the number of digits above said decimal point but not displayed in said numerical display, the sum of said number of digits not displayed and the number of displayed digits representing the number of digits above the decimal point of the number to be displayed.

3,911,263
STEREO VIEWER ACCUMULATOR
August J. Ronsse, Jr., Los Altos, Calif., assignor to Itek Corporation, Lexington, Mass.
Filed Mar. 19, 1974, Ser. No. 452,499
Int. Cl.[2] F21V *33/00*
U.S. Cl. 240—2 AT **6 Claims**



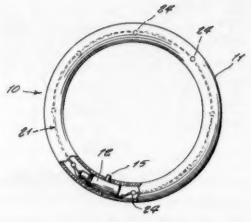
1. Apparatus for allowing a side-by-side viewing comparison on a viewing surface of first and second data sections of a data strip, which first and second data sections are substantially separated from each other along the length of the data strip, and for further allowing the side-by-side movement on the viewing surface of data sections which are also substantially separated from each other along the data strip, and comprising:

a. a viewing surface for allowing the examination of data sections on the data strip;

b. an adjustable data strip accumulator means, having a data strip entrance and a data strip exit, for transporting a length of accumulated data strip through it, said accumulator means being adjustable as to the length of the data strip accumulated in it; and,

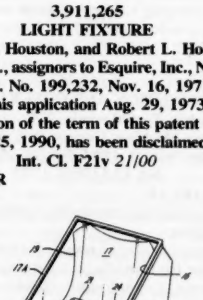
c. means for routing and transporting the data strip across the viewing surface from a first side to a second side of the viewing surface to position the first section of said data strip on said viewing surface, then from said second side of the viewing surface to said entrance to said data strip accumulator means, and after the data strip has been transported through said accumulator means then from said exit of said data strip accumulator means to said first side of said viewing surface, and then across said viewing surface to position the second section of said data strip on said viewing surface substantially parallel to the first section of the data strip running from said first side to said second side of the viewing surface, whereby the amount of the data strip accumulated in said accumulator means may be adjusted until data sections of interest are mounted side-by-side on the viewing surface for a detailed comparison and may be transported in the same direction on the viewing surface such that other data sections also substantially separated from each other along the data strip are moved side-by-side across the viewing surface.

3,911,264
LIGHTED RING TOY
Albert L. Chao, 407 Glendale Road, Northvale, N.J. 07647
Filed July 11, 1974, Ser. No. 487,791
Int. Cl.[2] F21V *33/00*
U.S. Cl. 240—6.4 R **4 Claims**



1. In a lighted ring toy, the combination of a looped hollow tube of translucent plastic, a plug fitted into opposite ends of said tube for retaining said tube in the shape of a ring, said plug being of plastic and having a first opening in one end thereof for frictionally holding a battery, a second opening along a side of said plug, a switch mounted in said second opening, a switch button of said switch extending beyond a periphery of a side of said plug, said switch button being located between said opposite ends of said tube fitted on said plug, and said switch button extending inwardly beyond an inner periphery of said ring, and being of adequate length for being grasped and operated by a user.

3,911,265
LIGHT FIXTURE
Leon L. Landrum, Houston, and Robert L. Holder, Nacogdoches, both of Tex., assignors to Esquire, Inc., New York, N.Y.
Division of Ser. No. 199,232, Nov. 16, 1971, Pat. No. 3,781,539. This application Aug. 29, 1973, Ser. No. 392,496The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.
Int. Cl. F21v *21/00*
U.S. Cl. 240—52 R **3 Claims**



1. A socket for use in engaging the non-electrical end of the lamp mounted in the housing of a light fixture, comprising a body having a tubular base having means on one end provid-

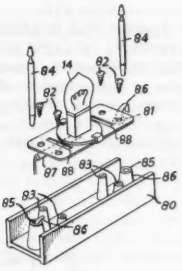
ing heat insulating and cushioning surfaces which diverge outwardly therefrom in a generally conical pattern, and internal threads adapted to receive a threaded pin on a wall of the housing in order to mount said heat insulating and cushioning surfaces in a position to engage and move axially toward and away from the non-electrical end of the lamp.

3,911,266

LAMP SUPPORT ASSEMBLY

John Anderson Oram, Osborne Cottage, Heath Road, Leighton Buzzard Bedfordshire, England

Division of Ser. No. 359,374, May 1, 1973, Pat. No. 3,832,539, which is a continuation of Ser. No. 185,493, Oct. 1, 1971, abandoned. This application Feb. 21, 1974, Ser. No. 444,424
Claims priority, application United Kingdom, Oct. 7, 1970, 47745/70
Int. Cl. F21v *21/08*
U.S. Cl. 240—52.1 **13 Claims**



1. A light device comprising:
an elliptical reflector having an opening through the back of the reflector;
two sockets disposed opposite each other outside the wall of the reflector;
a plug in lamp assembly comprising: a lamp with a filament; an elongated supporting means of electrically and thermally insulating material, the lamp being mounted on the supporting means and extending out from the supporting means with its axis at right angles to the supporting means; two pins mounted and extending transversely from the supporting means in the same direction as the lamp on opposite sides of the lamp, each pin extending out from the supporting means in the same direction as the lamp with its axis parallel to the axis of the lamp, the lamp having two terminals which are electrically connected to the two pins, respectively, the lamp extending through the opening in the elliptical reflector so that the filament is located at the focus of the reflector when the pins are fully inserted into the sockets and the supporting means providing a handle by which the lamp assembly can be gripped from outside the device.

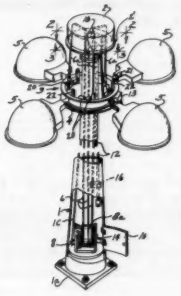
3,911,267

COMBINATION MAST AND LIGHT RAISING SIGNALLING MEANS AND LOWERING APPARATUS

Mogens Kiehn, 1740 Waukegan Road, Glenview, Ill. 60025

Division of Ser. No. 289,090, Sept. 24, 1972, Pat. No. 3,801,813. This application Mar. 22, 1974, Ser. No. 453,730
Int. Cl.² F21V *21/36*
U.S. Cl. 240—64 **4 Claims**

1. In combination, a mast and a light carrying unit on said mast including a frame supported by vertical cable means secured to said frame and lighting means carried on the frame, cable support means and cable moving means operable from the bottom of the mast which cable moving means raises and lowers the cable means to move said frame and the lighting means supported thereby between an upper position at the upper portion of the mast and a lower servicing position at the lower portion of the mast, and signalling means located at the upper portion of the mast at least when said frame and lighting means is approaching said upper position for signalling to the operator at the bottom of the mast when said frame has been raised to said upper position, said signalling means being a light reflector member mounted for movement on one of said mast and frame and capable of movably assuming a first position where a signalling surface of said reflector member can-



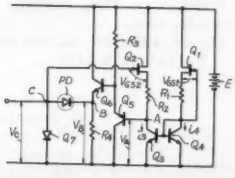
not be readily seen from below when said frame and the lighting means have not yet reached said upper position and assuming a second position upon contact of said light reflector member with the other of said mast and frame when the frame and lighting means reach said upper position where said signalling surface is clearly readily visible from the bottom of the mast.

3,911,268

PHOTODIODE BIASING CIRCUIT

Chiharu Mori, Tokyo, and Masahiro Kawasaki, Shimuranishidai, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed June 27, 1974, Ser. No. 483,710
Claims priority, application Japan, July 6, 1973, 48-79757
Int. Cl.² H01J *39/12*
U.S. Cl. 250—206 **14 Claims**



1. In a circuit having a photodiode to be biased, source follower circuit means including source follower FET means having gate and source terminals between which the photodiode is electrically connected, transistor means serially coupled to the source of said FET means for providing a constant current to said FET means, control circuit means including diode means connected between the base and emitter of said transistor means for providing a bias to said transistor means, and constant current means including a self-biased FET means serially coupled to said diode means.

3,911,269
CIRCUIT ARRANGEMENT HAVING AT LEAST ONE CIRCUIT ELEMENT WHICH IS ENERGISED BY MEANS OF RADIATION AND SEMICONDUCTOR DEVICE SUITABLE FOR USE IN SUCH A CIRCUIT ARRANGEMENT

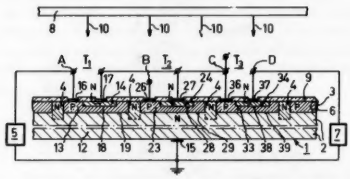
Cornelis Maria Hart, and Arie Slob, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 230,430, Feb. 29, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 527,029

Claims priority, application Netherlands, Mar. 20, 1971, 7103772; June 18, 1971, 7108373

Int. Cl.[2] H01J *39/12*

U.S. Cl. 250—211 J **24 Claims**



22. A semiconductor device comprising a semiconductor body comprising a transistor that includes a collector zone present at one side of the semiconductor body and constituting a collector-base junction with the base zone of the transistor and further includes an emitter zone, which viewed on the said side of the semiconductor body, is situated at least below the collector zone and which constitutes the emitter-base junction with the base zone, in which optic means are present to bias the emitter-base junction at least temporarily in the forward direction by optic irradiation and a supply source to the bias collector zone in the collecting condition, wherein viewed on the said one side of the semiconductor body, the collector-base junction has a considerably smaller lateral extent than the emitter-base junction, whereby the photo-current generated by the optic means across the emitter-base junction is larger in the case of an external short-circuit across said emitter-base junction than that across the collector-base junction in the case of an external short-circuit across said junction.

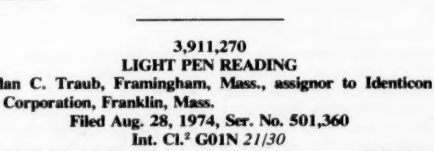
3,911,270
LIGHT PEN READING

Alan C. Traub, Framingham, Mass., assignor to Identicon Corporation, Franklin, Mass.

Filed Aug. 28, 1974, Ser. No. 501,360

Int. Cl.[2] G01N *21/30*

U.S. Cl. 250—227 **8 Claims**



1. Light pen reading apparatus comprising,

means defining an outer sleeve assembly having a stiff metallic front end terminating in a front metal surfaced opening,

transparent sphere means mounted in said opening and protruding therefrom for engagement with a surface to be scanned,

light source means mounted in a rear portion of the outer sleeve for emitting light in response to electrical energizing,

photodetector means mounted in a rear portion of the outer sleeve for converting light reflected from said surface through said transparent sphere means into a corresponding electrical signal,

electrical conductor means connected to said light source and photodetector means,

first and second fiberoptic means extending forwardly from said light source means and said photodetector means, respectively, to a point of convergence essentially on the axis of said outer sleeve,

and lens means resiliently mounted within said outer sleeve assembly between said opening and said inner sleeve base for focusing light from said point of convergence upon said surface and for focusing light reflected from said surface upon said point.

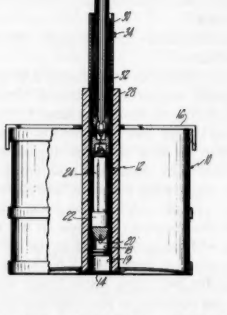
3,911,271
RADIOISOTOPE GAUGE FOR DETERMINING CEMENT CONTENT OF CONCRETE

Terry Michael Mitchell, Reston, Va., assignor to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Apr. 22, 1974, Ser. No. 462,618

Int. Cl.[2] G01D *18/00;* **G01N** *23/00*

U.S. Cl. 250—252 **5 Claims**



1. A non-destructive method of determining the quantity of a constituent of a pourable mixture comprising the steps of:

placing over a tubular spacer a standard comprised of a solid material having an aperture therein and having a constant radiation absorption characteristic in a sample container;

inserting a probe having a radiation source and a detector for backscattered radiation into the standard and measuring the radiation returned from the standard;

removing the standard from the sample container;

pouring the mixture to be tested into the container;

inserting the probe into the mixture and taking a plurality of measurements of backscattered radiation at different vertical levels of the mixture;

computing the average of the measurements taken with the test mixture in the container;

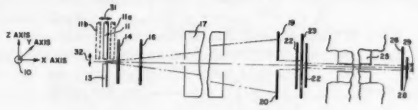
calculating the ratio of the average count measured with the test mixture to the count measured with the standard; and

determining the mixture content of the constituent of interest by comparing the calculated ratio to pre-established curves.

3,911,272
ION ILLUMINATION ANGLE CONTROL FOR A MASS SPECTROMETER

Robert J. Conzemius, Ames, Iowa, assignor to The United States Energy Research & Development Administration, Washington, D.C.

Filed Apr. 29, 1974, Ser. No. 464,889
Int. Cl.[2] H01J *39/34*
U.S. Cl. 250—281 **6 Claims**



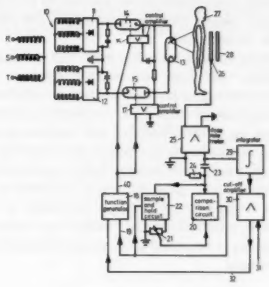
1. A device for controlling automatically the ion illumination angle in a spark source mass spectrometer which includes a spark source, a power supply coupled to said spark source for supplying a current thereto for developing ions, an ion detector and an ion beam forming and accelerating structure including a lens system for defining the ion beam and directing the same along an ion beam axis from the spark source to the ion detector, said controlling device comprising a first limiting plate positioned on one side of the ion beam and a second limiting plate positioned on the opposite side of the ion beam, said first and second limiting plates acting to intercept ions outside a main beam portion of the ion beam, said spark source including a first movable electrode and second electrode spaced apart from said first electrode, said first and second electrodes being coupled to the power supply and being responsive to the current supplied thereby to develop ions for the ion beam, a control circuit coupled to said first and second limiting plates and responsive to said ions intercepted by said first and second limiting plates to develop a first control signal which is a function of the ratio of said ions intercepted by said first and second limiting plates, electrode control means coupled to said control circuit and said first electrode and responsive to said first control signal to move said first electrode in a direction parallel to the ion beam axis to maintain said ratio of said ions intercepted by said first and second limiting plates at a predetermined value and thereby maintain the ion illumination angle at a desired value.

3,911,273
X-RAY DIAGNOSTIC APPARATUS FOR PREPARING X-AY EXPOSURES INCLUDING AN AUTOMATIC ILLUMINATING DEVICE AND AUTOMATIC ADJUSTMENT OF THE EXPOSURE VOLTAGE

Kurt Franke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Feb. 4, 1974, Ser. No. 439,612
Claims priority, application Germany, Apr. 27, 1973, 2321448
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—322 **6 Claims**

1. In an X-ray diagnostic apparatus having an X-ray tube for the making of X-ray exposures of a patient; including an automatic exposure timer means for automatically switching off the X-ray tube upon an X-ray film being subject to a predetermined dosage of rays; and means for automatically adjusting the voltage of the X-ray tube, the improvement comprising; said voltage adjusting means being adapted to automatically lower the X-ray tube voltage at the initiation of each exposure during a small time interval in comparison with the shortest exposure time of said apparatus from a maximum initial value, equal for all examinations, and based on a largest patient bulk; and comparison circuit means operatively connected to said voltage adjusting means and adapted to control the latter, said comparison circuit having a first input receiving a signal as an actual value proportionate to a differential quotient of the X-ray dosage quantity measured behind the patient in the direction of the X-rays pursuant to the X-ray tube voltage, and a second input receiving a reference value signal corresponding to a desired image contrast; and means

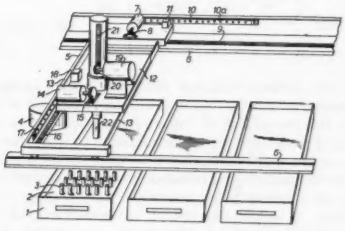


transmitting a signal from the output of said comparison circuit means to said voltage adjusting means for maintaining the X-ray tube voltage constant upon said first and second input signals being equal.

3,911,274
DEVICES FOR MOVING SAMPLE HOLDERS TO A MEASURING POSITION AND FOR EFFECTING RADIOACTIVE OR OTHER MEASUREMENTS OF SAMPLES IN THE HOLDERS

Cornelis J. Roos, The Hague, and Peter Gilles, Rijswijk, both of Netherlands, assignors to Baird Atomic (Europe) B.V., The Hague, Netherlands

Filed Aug. 7, 1973, Ser. No. 386,354
Claims priority, application Netherlands, Aug. 8, 1972, 7210822
Int. Cl. G01t *7/02*
U.S. Cl. 250—328 **13 Claims**



1. In a sample-measuring device,
measuring means, and
moving means operative to remove sample holders from predetermined positions in a carrier in accordance with a control program, to transfer the holders to the measuring means and to return the holders from the measuring means to the predetermined positions, said carrier being in the form of removable tray means which remains stationary during the measuring operation, the sample holders being arranged in mutually perpendicular rows and columns in the tray means, and the said moving means comprising
a carriage,
first guide means extending in the direction of the said rows of sample holders,
a first motor operative to move the carriage along the first guide means,

slide means mounted on the carriage,
second guide means, said second guide means extending transversely to the first guide means,
a second motor operative to move the slide means relative to the carriage along the second guide means,
vertically movable grab means for engaging the sample holders, said grab means being carried by the slide means, first contact means fixed in relation to the first and second guide means, and
second contact means movable with the carriage and the slide means, said first and second contact means cooperating to energise the said motors to position the grab means successively above the respective sample holders in the tray as determined by the control program, the measuring means being positioned between the first guide means such that a said sample holder removed from the tray means by the grab means is located by the grab means in a measuring position at which a measuring operation is effected by the measuring means, and the sample holder is returned to its predetermined position in the tray means.

3,911,275

INFRARED DETECTION SYSTEM AND WINDOWS USED THEREIN

William H. Dumbaugh, Jr., Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 27, 1971, Ser. No. 137,855
Int. Cl. C01j *5/10*
U.S. Cl. 250—339 **4 Claims**

1. In an infrared radiation detection system comprising a heat-sensitive detector whose electrical resistance is changed by the thermal effect of infrared radiation and a window capable of transmitting infrared radiation to said detector, the improvement which comprises a window having a substantial transmission for infrared radiation in the wavelength range of five to six microns being produced from a glass consisting essentially, in weight percent on an oxide basis, of 25–50% GeO_2, 10–50% La_2O_3, 5–50% Ta_2O_5, and 2–20% ZnO and which is abrasion resistant and exhibits a coefficient of thermal expansion (25°–300°C.) of less than 80×10^{-7}/°C.

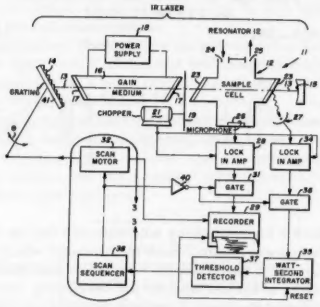
3,911,276

LASER SPECTROSCOPY

William E. Bell, Mountain View, Calif., assignor to Diax Corporation, Sunnyvale, Calif.

Filed Oct. 18, 1974, Ser. No. 515,996
Int. Cl.² G01J *1/00*
U.S. Cl. 250—343 **12 Claims**

1. In a laser spectrometer:
laser means for producing a laser beam of coherent optical radiation;
sample cell means for interposing a sample medium to be analyzed in said laser beam;
detecting means for detecting the absorbance of energy, if any, by said sample medium from said laser beam;
power monitoring means for monitoring the laser beam power; and
correlating means for correlating the laser beam power for a given wavelength with the time during which the sample is being irradiated and during which the sample absorbance is detected so that the sample is irradiated with a certain predetermined watt-seconds of beam power at a given wavelength during the detection of sample absorbance, whereby the sensitivity of the laser spectrometer is normalized at said given wavelength.

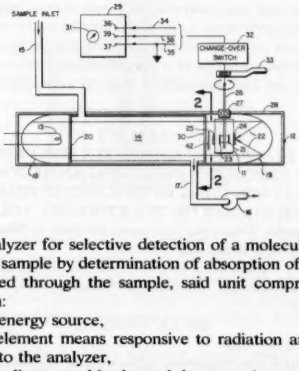


3,911,277

DUAL LIGHTHOUSE DETECTOR

Carl N. Cederstrand, Brea, and Charles A. Keenan, Irvine, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed July 25, 1974, Ser. No. 491,672
Int. Cl.² G01N *21/34*
U.S. Cl. 250—345 **8 Claims**



1. An analyzer for selective detection of a molecular constituent in a sample by determination of absorption of radiant energy passed through the sample, said unit comprising in combination:
a radiant energy source,
a sensor element means responsive to radiation and connected to the analyzer,
a sample cell mounted in the path between the source and the sensor element means, the cell having windows which are transparent to radiation of interest from the source, a movable mounting comprising light impervious walls with windows therein, said sensor element means being positioned behind said walls with respect to the radiant energy, and
a filter in each window effective for filtering radiant energy of different wavelengths characteristic to the constituent to be detected,
said mounting being arranged to expose only one of said windows to radiation in a selected position thereof, and to expose only another one of said windows in another position thereof, said mounting is rotatable with windows

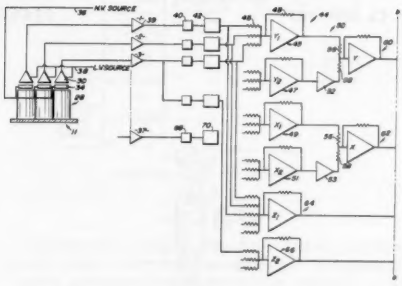
at different angular positions and with the sensor element means within the walls of the mounting, and means are provided to orient the mounting in a given direction toward the radiant energy whereby the angular position of the mounting determines which window receives the radiation.

3,911,278

RADIATION SENSING DEVICE

Karl J. Stout, Hudson, Mass., assignor to Ohio Nuclear, Inc., Solon, Ohio

Continuation-in-part of Ser. No. 269,046, July 5, 1972, abandoned. This application June 14, 1973, Ser. No. 370,163
Int. Cl. G01t *1/20*
U.S. Cl. 250—366 **9 Claims**



1. A radiation sensing device comprising:
means for forming a visible response from radiation;
means for converting the visible response from radiation to electrical impulses including at least three photomultiplier tubes positioned substantially adjacent to and on one side of the means for forming in order that the photomultiplier tubes receive radiation, view common radiation and give electrical impulses as a result thereof, the proximity of the photomultiplier tubes to the means for forming a visible response causing distortion of the relation of the electrical impulses to the location of the radiation;
means for operating on the electrical impulses operatively connected to the means for converting to create a signal which gives an accurate indication of the relative location of the radiation, the means for operating including a non-linear circuit including an input, an output and a diode having a preselected threshold voltage, the diode being connected between the input and output and shunting the output and a bias voltage applied to the diode so that the diode conducts beyond the preselected threshold value and bias voltage in order to correct for the distortion.

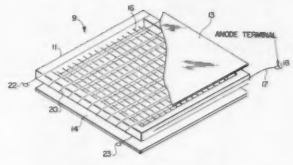
3,911,279

POSITION SENSITIVE MULTIWIRE PROPORTIONAL COUNTER WITH INTEGRAL DELAY LINE

Jerry R. Gilland, and Jan G. Emming, both of Boulder, Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Filed May 17, 1973, Ser. No. 361,134
Int. Cl. G01t *1/18*
U.S. Cl. 250—385 **13 Claims**

1. A position sensitive multiwire proportional counter comprising:
support means defining an enclosure for containing an ionizing gas,
a plurality of anode wires carried by said support means, said anode wires being spaced from one another,
first terminal means connected with said anode wires for coupling an electrical charge thereto,
a continuous cathode wire adjacent to said support means and spaced from said anode wires such that an electrical signal is induced therein upon the passage of ionizing radiation adjacent thereto, and
a second and third terminal connected with said cathode wire for coupling a signal that is indicative of the position of ionizing radiation interacting within said support



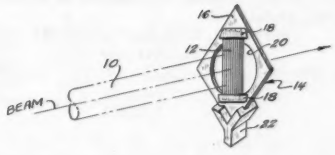
means when said first, second and third terminal means are connected to establish a voltage differential between said anode wires and cathode wire; said support means comprising:
a frame having first and second pairs of side members, each member of a pair being opposite the other member of the respective pair, said first pair of side members supporting said anode wires, and
said cathode wire being continuously wound back and forth between and around said second pair of side members.

3,911,280

METHOD OF MEASURING A PROFILE OF THE DENSITY OF CHARGED PARTICLES IN A PARTICLE BEAM

Lloyd G. Hyman, La Grange Park, and Donald J. Jankowski, Bolingbrook, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 11, 1974, Ser. No. 460,228
Int. Cl.² G01T *1/16*
U.S. Cl. 250—395 **10 Claims**

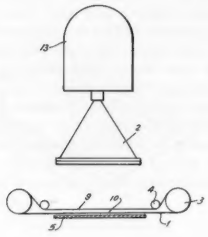


1. A method of determining the relative particle density as a function of position of charged particles in a beam comprising the steps of:
a. disposing a first plurality of parallel rods in and shadowing a beam;
b. irradiating said first plurality of rods in said beam for a predetermined time to produce transmutations to radioactive elements;
c. removing said first plurality of rods from the beam; and
d. measuring the radiation emitted by said radioactive elements in each rod of said first plurality of rods,
which radiation in association with the known position of each rod of said first plurality of rods is a measure of the relative particle density as a function of position in said beam.

3,911,281
ARRANGEMENT FOR SELECTIVELY IRRADIATING WEBS

Bernd Ihme, Dresden, Germany, assignor to Veb Textilkombinat Cottbus, Cottbus, Germany

Filed Feb. 12, 1974, Ser. No. 441,877
Int. Cl.[2] H01J 3/14
U.S. Cl. 250—492 A 9 Claims

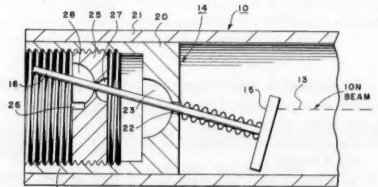


1. An arrangement for selectively irradiating webs of material, particularly textiles and the like, comprising a band which is substantially impermeable to radiation having an energy less than a predetermined value, said band being provided with perforations so as to permit the passage therethrough of radiation having an energy less than said predetermined value; moving means for moving said band in an endless path wherein said band has two juxtaposed runs; conveying means for conveying a web of material in another path having a portion which extends across one of said runs at a side of the latter which faces away from the other of said runs, said conveying means being arranged so that the direction of movement of said web in said portion defines with the direction of movement of said band in either of said runs an angle greater than 0° and less than 180°; and irradiating means at a side of said other run which faces away from said one run and being adapted to direct a beam of radiation having an energy less than said predetermined value through said perforations at said portion.

3,911,282
AXIAL ION BEAM ACCELERATOR TUBE HAVING A WOBBLED TARGET

Reuben A. Bergan, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 1, 1973, Ser. No. 411,981
Int. Cl. G01t 1/16
U.S. Cl. 250—442 5 Claims

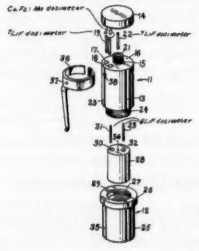


1. In a static atmosphere ion beam accelerator having a beam source of ions, means for accelerating said ions and a target for said accelerated ions, the improvement comprising:
an elongated member having first and second ends and upon a first end of which said target is mounted;
a housing within said accelerator providing a pivot for said elongated member between said first and second ends; and
means between said second end and said pivot for rotating the target mounted on said first end of said elongated member about said pivot and about the longitudinal axis of said beam of ions, thereby causing the accelerated ions to trace a path of varying radius on said target in a manner functionally related to said rotation.

3,911,283
PERSONNEL IONIZING RADIATION DOSIMETER

Robert A. Williams, Vandergrift, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 8, 1974, Ser. No. 440,893
Int. Cl. G01t 1/02
U.S. Cl. 250—483 22 Claims



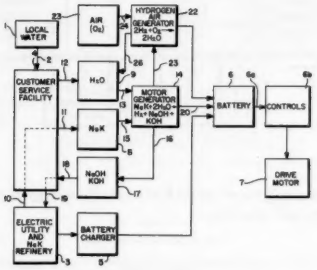
1. A personnel radiation detecting and measuring device comprising
A. A first section constructed of neutron moderating tissue equivalent material and containing first and second ^{6}LiF dosimeters, said first ^{6}LiF dosimeter being positioned sufficiently close to one surface of said first section that it is exposed to substantially all of the beta, gamma, neutron, and X-radiation incident on said surface and said second ^{6}LiF dosimeter being so positioned that a measurable portion of the beta, gamma, and X-radiation is attenuated by said neutron tissue equivalent material, and a measurable portion of the incident neutron radiation, and the neutron radiation reflected from the person of a wearer, is moderated by said neutron moderating tissue equivalent material before said radiations reach said second ^{6}LiF dosimeter and
B. A second section constructed of neutron transparent tissue equivalent material and containing first and second ^{7}LiF dosimeters and a CaF_2:Mn dosimeter, said first ^{7}LiF dosimeter and the CaF_2:Mn dosimeter being so positioned that they are exposed to substantially all of the beta, gamma, and X-radiation incident on one surface of said second section, and said second ^{7}LiF dosimeter being so positioned that the thickness of tissue equivalent material between said surface and said second ^{7}LiF dosimeter is approximately equal to the thickness of tissue equivalent material between the said surface of said first section and said second ^{6}LiF dosimeter,
the said surfaces of said first and second sections being in alignment.

3,911,284

FUEL AND VEHICLE SYSTEM BASED ON LIQUID ALKALI METAL

Stephen F. Skala, 3839 S. Wenonah, Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 301,285, Oct. 27, 1972, abandoned. This application Apr. 2, 1974, Ser. No. 457,207
Int. Cl.[2] B60L *11/12*
U.S. Cl. 290—16 23 Claims



1. A sodium and potassium liquid fuel system, including

a power plant having a sodium potassium fuel reservoir, a motor generator with a combustion chamber, a water reservoir, a spent alkali hydroxide collector, means to convey the fuel and water to the motor generator, and means to transfer the spent hydroxides to said collector,

a regenerating station separate from said power plant and having a refinery for the spent alkali hydroxides, an electric power source operating said refinery to regenerate the spent alkali hydroxides to sodium potassium fuel and a service facility to store the regenerated fuel together with water,

connectable removing means between the collector and service facility and the refinery so that the spent hydroxides may be received in the refinery, and

connectable return means between the service facility and the reservoirs so that the fuel and water may be returned to the reservoirs.

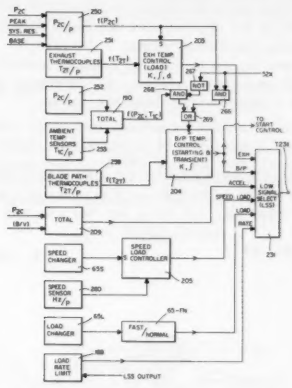
3,911,285

GAS TURBINE POWER PLANT CONTROL APPARATUS HAVING A MULTIPLE BACKUP CONTROL SYSTEM

Robert A. Yannone, Aldan, and James J. Shields, Philadelphia, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 20, 1973, Ser. No. 371,625
Int. Cl.[2] F02C *9/08*
U.S. Cl. 290—40 24 Claims

1. A gas turbine electric power plant comprising a gas turbine having compressor, combustion and turbine elements, a generator driven by said gas turbine, a fuel system for supplying fuel to said gas turbine combustion element, a control system having a plurality of control paths with inputs constantly connected to predetermined elements of said turbine and said generator, the output of said control system being connected to and continuously providing an output signal for operating said fuel system to energize said turbine, said control paths including a first plurality of primary control paths for developing a primary control signal for operating said fuel system during turbine startup, load and shutdown operations, and a second plurality of control paths for developing temperature backup control signals, each said backup control signal being a predetermined function of the temperature of a respective one of said turbine elements and at least one other turbine operating condition, said control system including



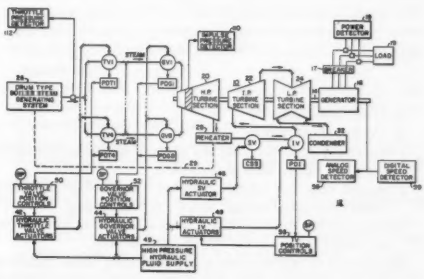
means for selecting one of said backup signals as said control system output under predetermined turbine conditions.

3,911,286

SYSTEM AND METHOD FOR OPERATING A STEAM TURBINE WITH A CONTROL SYSTEM HAVING A TURBINE SIMULATOR

Robert Uram, East Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 247,852, April 26, 1972, abandoned. This application Sept. 11, 1973, Ser. No. 396,160
Int. Cl. G05g *15/00*; G06f *15/06*
U.S. Cl. 290—40 39 Claims



1. A turbine for an electric power generating system comprising:

a turbine for driving a plant generator,

means for controlling the flow of an energizing fluid to said turbine,

means for automatically controlling said flow controlling means to control the turbine speed during and after startup,

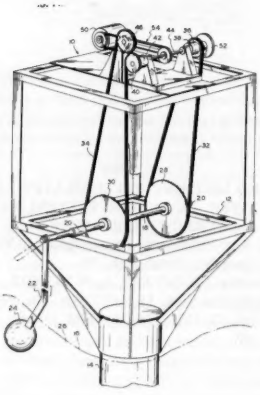
means for automatically controlling said flow controlling means to control the turbine load after the turbine reaches synchronous speed,

said automatic controlling means including means for generating electric signals for said flow controlling means as a function of reference and feedback signals,

means for controlling the operation of said flow controlling means in response to the electric signals and in turn the operating state of said turbine,

means for generating at least one simulated response to predetermined outputs generated by said automatic controlling means,
means for connecting said automatic controlling and said generating means to operate in a simulation mode including means for applying the simulated response to said automatic controlling means,
and means for operating said backup control means to control said turbine when said automatic controlling means is placed in the simulation mode.

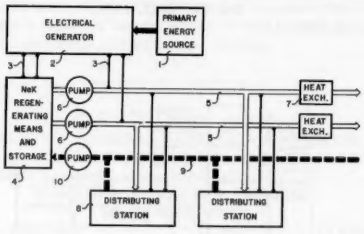
3,911,287
WAVE DRIVEN POWER GENERATORS
Robert Lee Neville, 1180 Hallinan, Lake Oswego, Oreg. 97034
Filed Mar. 13, 1974, Ser. No. 450,736
Int. Cl.[2] F03B *1/12*
U.S. Cl. 290—53 **5 Claims**



1. In combination,
an output shaft means,
a first one-way clutch coupled to the shaft means for driving the shaft means in one direction,
a second one-way clutch coupled to the shaft means for driving the shaft means in said one direction,
bidirectionally moving power means including a float and a reversible power train driven by the float,
the reversible power train including drive shaft means and a lever keyed at one end to the drive shaft means and connected to the float at the other end thereof,
and a pair of oppositely driving coupler means driven by the power means for driving the one-way clutches in opposite directions.

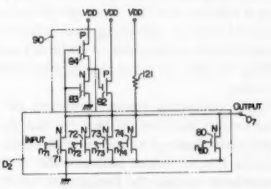
3,911,288
ENERGY TRANSPORT SYSTEM AND METHOD
Stephen F. Skala, 3839 S. Wenonah Ave., Berwyn, Ill. 60402
Continuation-in-part of Ser. No. 301,285, Oct. 27, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 435,117
Int. Cl.[2] H01B *1/02*
U.S. Cl. 307—147 **18 Claims**

1. A method for transmitting electrical energy and delivering liquid metal fuel along a pipeline, including the steps of
moving said liquid metal through a pipeline,
connecting generated electrical power to said liquid metal within said pipeline,
using said electrical energy carried by said liquid metal at a location along said pipeline, and



oxidizing said liquid metal fuel to obtain energy at a location along said pipeline.

3,911,289
MOS TYPE SEMICONDUCTOR IC DEVICE
Toyoki Takemoto, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 16, 1973, Ser. No. 388,793
Claims priority, application Japan, Aug. 18, 1972, 47-82640; Aug. 21, 1972, 47-83452
Int. Cl.[2] H03K *19/08, 19/34;* **H01L** *29/78, 27/04*
U.S. Cl. 307—205 **7 Claims**

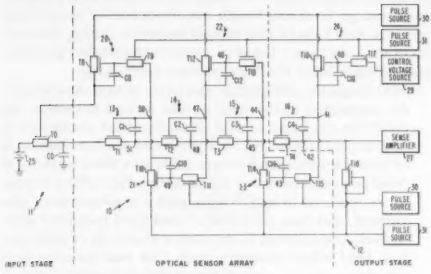


1. A metal-oxide-semiconductor type semiconductor integrated circuit device having a multi-input gate circuit comprising:
a driving stage including a plurality of metal-oxide semiconductor transistors of one conductivity type having respective gates for receiving input signals and a common output terminal, said plurality of metal-oxide-semiconductor transistors being connected in parallel with each other;
a first load connected between said output terminal of the driving stage and a voltage source terminal;
a second load consisting of a metal-oxide-semiconductor transistor having an opposite conductivity type from that of said plurality of metal-oxide-semiconductor transistors and connected in parallel with said first load between said output terminal and said voltage source terminal for establishing a current path therebetween; and
a complementary metal-oxide-semiconductor inverter connected between said output terminal and said voltage source terminal and supplying the output thereof to the gate of said metal-oxide-semiconductor transistor of the opposite conductivity type, the total conductance of said first and second loads changing rapidly in response to an inversion signal at said common output terminal, said inversion signal being determined by input signals applied to said driving stage.

3,911,290
N-PHASE BUCKET BRIGADE OPTICAL SCANNER

Richard Arthur Kenyon, Underhill Center, and Norbert George Vogl, Jr., Colchester, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 10, 1974, Ser. No. 478,142
Int. Cl.[2] H03K *21/00*
U.S. Cl. 307—221 C 8 Claims



7. A storage array comprising three storage cells in series between an input stage and an output stage,

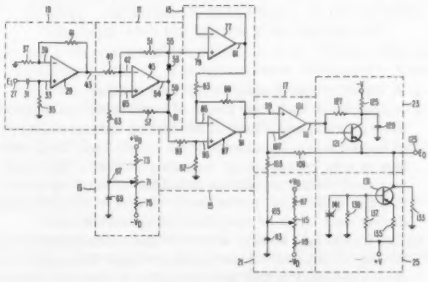
each cell comprising a transistor having input, output, and control terminals and a capacitor coupled between the output terminal and the control terminal of the transistor, a series of sequential phase driver circuits coupled between said input stage and said output stage,

two pulse means coupled to each of said sequential phase driver circuits for providing to each sequential phase driver circuit two alternating out of phase series of pulses, each phase driver circuit comprised of a phase driven transistor driving a transistor-capacitor circuit, said phase driven transistor having its control electrode coupled to one of said pulse sources and its output coupled to the control electrode of the transistor in the transistor capacitor circuit with the input of the transistor capacitor circuit being coupled to the other of said pulse sources to cause a pulse from said other source to be introduced onto the control electrode of the storage cell circuit such that each bit of stored information in said cells is sequentially transferred from the array.

3,911,291
AC TO ABSOLUTE VALUE LINEAR CONVERTER

Allen J. Rossell, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed July 23, 1973, Ser. No. 381,710
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—229 15 Claims



1. A circuit for linearly converting AC input signals to absolute value output signals comprising:

means for precisely rectifying the AC input signal into positive and negative half-wave wavetrains;

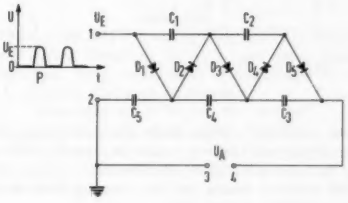
differential amplifier means for combining said positive and negative half-wave wavetrains into a full-wave rectified wavetrain; and

impedance means for unidirectionally isolating said rectifying means from said differential amplifier means.

3,911,292
COCKCROFT-WALTON CASCADE CIRCUIT FOR VOLTAGE MULTIPLICATION

Paul Petrick; Hans-Peter Schwedler, both of Landshut, and Alfred Holzer, Schonbrunn, all of Germany, assignors to Ernst Roederstein Spezialfabrik, Landshut, Germany

Filed Dec. 10, 1973, Ser. No. 423,574
Claims priority, application Germany, Dec. 21, 1972, 2262804
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—235 3 Claims



1. An improved voltage multiplying circuit comprising,

first and second input terminals for receiving unipolar pulses therebetween,

an output terminal

at least first and second storage capacitors connected in series between said second terminal and said output terminal,

at least first, second and third unilaterally conducting devices connected in series and poled in the same sense with the first of said devices connected from said first input terminal to the junction of said first and second storage capacitors,

and at least a first pumping capacitor connected from said first input terminal to the junction of said second and third unilaterally conducting devices,

said third unilaterally conducting device being connected between said first pumping capacitor and said second storage capacitor,

said first pumping capacitor having means for establishing lower tendency toward internal discharges than characterizes said storage capacitors to provide good electrical performance as a voltage multiplying circuit within a physical assembly smaller than that which would characterize a voltage multiplying circuit consisting of both pumping and storage capacitors each having the same tendency toward internal discharges.

3,911,293
SENSE THRESHOLD AMPLIFIER FOR HIGH DENSITY MEMORY

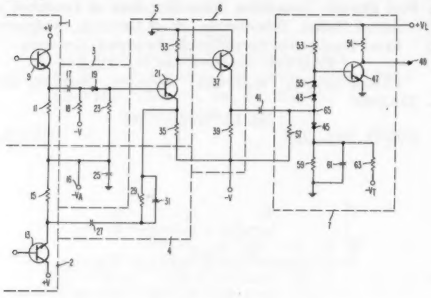
Philip E. Shafer, Holmes, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 20, 1974, Ser. No. 452,831
Int. Cl.[2] H03K *5/20*
U.S. Cl. 307—235 R 9 Claims

1. A sense amplifier for detecting analog sense signals representative of digital data, said signals in one polarity representing digital "ONES" and in an opposite polarity representing digital "ZERO'S", said signals being differentially inputted to the sense amplifier over a first lead and a second lead, respectively, comprising:

first and second means for sensing, linearly amplifying, and clipping voltages incoming over said first and second leads respectively;

an amplifier means including a current-control device having a control electrode and first and second current-carrying electrodes, said first current-carrying electrode being resistively grounded and having an output therefrom and said second current-carrying electrode being connected through a resistance to a first dc voltage source;



means receiving voltages from said first sensing, linearly amplifying and clipping means for coupling sense signals to the control electrode of said current control device of said amplifier means and for diverting noise away from said amplifier means; and

means receiving voltages from said second sensing, linearly amplifying and clipping means for coupling sense signals to said second current carrying electrode of said current control device of said amplifier means, a current flow in said second current-carrying electrode being inhibited by sense signals representing a digital ONE.

3,911,294

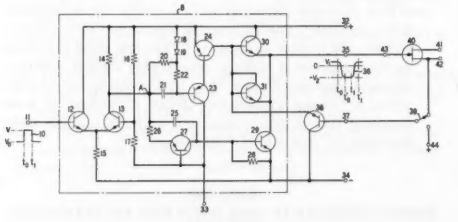
DRIVER CIRCUIT FOR HIGH SPEED GATING OF A FIELD EFFECT TRANSISTOR

Paul Cooper Davis, and Milton Luther Embree, both of Reading, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 16, 1974, Ser. No. 497,900

Int. Cl.[2] H03K *17/00*

U.S. Cl. 307—251 **9 Claims**



1. In a driver circuit, having an input terminal, and an output terminal for connection to the gate electrode of a field effect transistor, and including first and second transistors, the collector-emitter paths of said first and second transistors serially connected between first and second terminals of fixed potential; a first circuit path connected between said input terminal and the base of said first transistor, said first circuit path including first circuit means for momentarily supplying current to said base of said first transistor in response to a transition between a first and second predetermined voltage level applied to said input terminal, and second circuit means responsive to said second predetermined voltage level for maintaining current to said base of said first transistor during that portion of time said input terminal remains at said second predetermined voltage level; a second circuit path connected between said input terminal and the base of said second transistor, said second circuit path including third circuit means for supplying base current to said second transistor in response to a transition in said signal at said input terminal from said second predetermined voltage level to said first predetermined voltage level and fourth circuit means for maintaining current to said base of said second transistor during that portion of time said input terminal remains at said first predetermined voltage level, the improvement comprising:

a third transistor, the emitter electrode of said third transistor connected to the base of said second transistor, the collector electrode of said third transistor connected to said second terminal of fixed potential, the base electrode of said third transistor connectable to a third terminal of fixed potential such that said junction field effect transistor is operated in an ON state with a predetermined gate current, said base electrode of said third transistor alternatively connectable to the source electrode of said junction field effect transistor such that said junction field effect transistor is operated in an ON state with a substantially constant voltage, of a magnitude insufficient to effect substantial gate current, maintained between the gate and source electrodes.

3,911,295

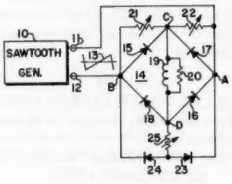
WAVEFORM GENERATING CIRCUIT

William Henry Barkow, Pennsauken, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,372

Int. Cl.[2] H03K *5/12*

U.S. Cl. 307—261 **6 Claims**



1. A waveform generating circuit comprising:

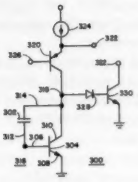
a bridge circuit including a pair of input terminals adapted to be coupled to a source of alternating current and a pair of output terminals adapted to be coupled to a load, both legs of said bridge circuit including at least a first unidirectional conducting device poled for conducting current through said load in the same direction therethrough during each cycle of said alternating current; and

means including a second unidirectional conducting device having a different barrier height voltage than said first device coupled to said first device in at least one of said legs and poled for conducting current in the same direction as said first device in said one leg for providing a load current path around said first device and for biasing said first device for conducting at a different level of load current than said second device.

3,911,296
CAPACITANCE MULTIPLIER CIRCUIT

William Folsom Davis, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 332,825, Feb. 15, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,754
Int. Cl.² H03K 1/12
U.S. Cl. 307—297 3 Claims



1. An integrated circuit filtering circuit on a monolithic semiconductor integrated circuit chip having an input for filtering high frequency signal components from a signal applied to said input comprising:

a first input transistor having a base connected to bias circuit, means for establishing a bias threshold voltage at said base at said first input transistor an emitter connected to said input, and a collector;

capacitance multiplier circuit means connected to said collector of said first input transistor for multiplying the effective capacitance of an integrated capacitor of said capacitance multiplier circuit means by approximately the current gain of a second transistor of said capacitance multiplier circuit means and providing a filtered signal at said collector of said first input transistor, said integrated circuit capacitor having first and second nodes thereof, said second transistor having a base, a collector, and an emitter, said first node of said integrated capacitor being connected to a collector of said first input transistor and said second transistor and the second node of said integrated capacitor being connected only to the base of said second transistor so as to forward bias the emitter-base junction of said second transistor in response to a signal applied at said input; and

a current source coupled between a voltage conductor and said input.

3,911,297
VARIABLE CAPACITANCE DIODES EMPLOYING A GLASSY AMORPHOUS MATERIAL AS AN ACTIVE LAYER AND METHODS FOR THEIR USE

Seymour Merrin, Fairfield, Conn.; Jack K. Clifton, New City, N.Y., and John S. Katsigianopoulos, Bridgeport, Conn., assignors to Innotech Corporation, Norwalk, Conn.

Filed Mar. 16, 1973, Ser. No. 342,081
Int. Cl.² H03K 3/42; H01L 27/14
U.S. Cl. 307—311 6 Claims

1. In combination:

a light variable capacitance diode comprising:

a substrate of semiconductor material exhibiting a first kind of electronic conductivity;

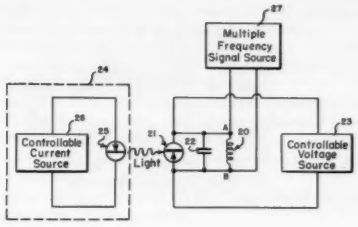
disposed upon said substrate, a layer of glassy amorphous material exhibiting the other kind of electronic conductivity, a diode junction being formed thereby;

a first conductive means for making ohmic contact with said substrate;

second conductive means for making electrical contact with said layer of glassy amorphous material;

a source of controllable intensity light optically coupled to said diode junction for supplying light to the junction; and

means for varying the intensity of light from said control-

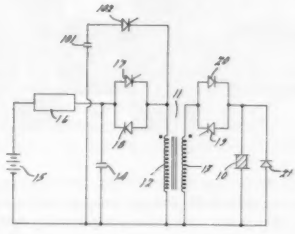


lable intensity source thereby varying the capacitance between said first and second conductive means.

3,911,298
CONTROL CIRCUITS FOR PIEZOELECTRIC DEVICES

Reinhard Alfred Borsdorf, Northolt, and John Frederick Crudgington, West Ewell, both of England, assignors to C.A.V. Limited, Birmingham, England

Filed June 24, 1974, Ser. No. 482,447
Claims priority, application United Kingdom, June 28, 1973, 30877/73
Int. Cl.² H01L 41/08
U.S. Cl. 310—8.1 5 Claims



1. A control circuit for controlling the electrical charging and discharging of a stack of piezo-electric crystals and comprising a capacitor, means for connecting said capacitor to a source of supply, a transformer having primary and secondary windings, a first thyristor connected between said capacitor and primary winding and which when fired allows the capacitor to discharge through said primary winding, a diode, a stack of crystals, said secondary winding being connected through said diode to said stack of crystals so that the stack of crystals is charged when said first thyristor is fired, and a second thyristor connected to said stack of crystals, and means for firing said second thyristor to effect discharge of said stack.

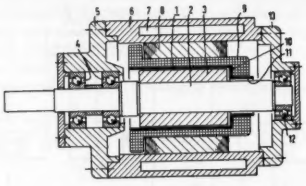
3,911,299
HIGH SPEED COMMUTATORLESS D.C. MOTOR

Reiner Kristen; Manfred Liska; Peter Tschirner, all of Nurnberg, and Hans Kuhnlein, Grossgrundlach, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 28, 1974, Ser. No. 437,229
Claims priority, application Germany, Feb. 16, 1973, 2307800
Int. Cl.² H02K 9/22
U.S. Cl. 310—64 6 Claims

1. In a commutatorless d.c. motor which includes a permanent-magnet rotor, bearing support means, a slotless stator return yoke and stator windings, means for making the thermal resistance between the stator winding and the rotor

greater than the thermal resistance between the stator winding and the return yoke comprising thermal insulating means in the form of insulating material in which said stator windings



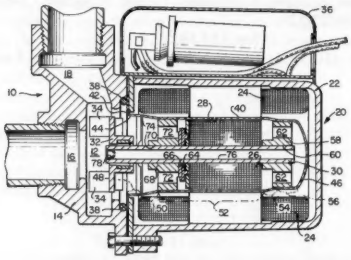
are embedded, the insulating material having a greater heat transfer resistance on the side of the stator winding nearer the rotor than on the side nearer the return yoke.

3,911,300

ENCAPSULATED WET DYNAMOELECTRIC MACHINE ROTOR

Benno Lebkuchner, Warwick, R.I., assignor to Taco, Inc., Cranston, R.I.

Filed Aug. 13, 1971, Ser. No. 171,694
Int. Cl.² H02K *5/12*
U.S. Cl. 310—86 **8 Claims**



1. A rotor and shaft package adapted for insertion within the bore of a stator, comprising a generally cylindrical container formed of a material having a low magnetic permeability, bearing means in said container, said bearing means including a journal surface, a shaft journaled in said journal surface, a rotor mounted on said shaft for rotation in said container, said container including aligning means for coaxially aligning said container with said stator, means for fixing said bearing means relative to said container so that said shaft is journaled in said bearing means coaxial with said container, said means for fixing said bearing means including a curable adhesive for bonding said bearing means to the inner surface of said container, said bearing means being sized slightly smaller but generally similar in shape to the portion of said inner surface to which said bearing means is bonded, whereby when said container is aligned coaxial with said stator said shaft is coaxial with said stator.

3,911,301

DUAL PULSE TRAIN GENERATING APPARATUS UTILIZING ONLY ONE MAGNETIC SENSOR

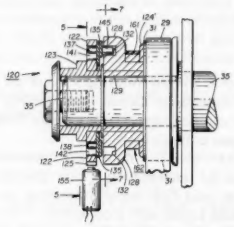
Arthur F. Riley, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 12, 1973, Ser. No. 423,950
Int. Cl.² H02K *39/00*
U.S. Cl. 310—111 **11 Claims**

1. A mechanically driven apparatus for effecting multiple magnetic sensor-generated pulse trains, comprising:

rotatable means adapted for mounting on and rotation with an associated drive shaft, said rotatable means having a plurality of ferromagnetic protuberances spaced in a circular array about the axis thereof, each of said protuberances being contoured so as to result in a sharply defined pulse being generated in response to each successive protuberance being moved at a predetermined speed through and disrupting in a predetermined manner a magnetic field established by a magnetic sensor when positioned adjacent the path of travel of said protuberances, at least one of said protuberances being formed in part by a selectively displaceable segment which, when displaced and upon being moved through a sensor-generated magnetic field, effects the generation of an additional time-related, but distinctive magnetic sensor-generated pulse from the one also effected by said segmented protuberance;

each of said fixed protuberances being formed in the outer periphery of said rotatable means with an arcuate, outwardly tapered peripheral surface that is terminated by an abrupt, under-cut portion so as to form a sharply defined notch,



means for displacing said segment after each successive predetermined degree of angular displacement of said rotatable means so that two distinct output pulse trains may be generated by a single magnetic sensor; said displacing means including

a rotatable member having an oversized aperture so as to allow the positioning thereof coaxially of a common drive shaft in juxtaposition with said rotatable means, said rotatable member having a finger-like portion extending outwardly thereof to form said protuberance segment;

coupling means for allowing said rotatable member not only to rotate with said rotatable means, but to be perpendicularly displaced relative to the axis thereof; and

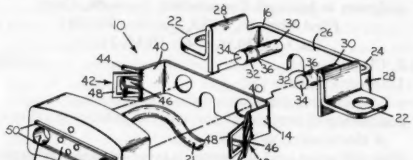
cam-actuating means associated with said rotatable member for periodically displacing said protuberance segment after each successive predetermined degree of angular displacement of said rotatable means.

3,911,302

WHEEL SPEED SENSOR MODULE ASSEMBLY

Gerald DeClaire, Bloomfield Hills, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 27, 1974, Ser. No. 527,609
Int. Cl.² H02K *19/20*
U.S. Cl. 310—168 **18 Claims**



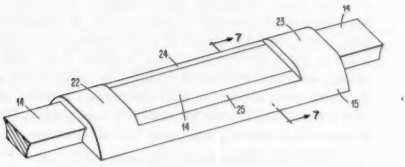
1. A magnetic sensor module for a wheel speed sensor assembly which said assembly is capable of being installed in association with a wheel rotatably mounted on an axle and

includes an annular rotor means adapted to be coaxially aligned with and connected to said wheel for rotation therewith, said magnetic sensor module comprising:
magnetic sensor means alignable with a sector of said annular rotor means;
a support frame adapted to be fixed on said axle in alignment with said annular rotor means and having post means extending therefrom toward said annular rotor means to be generally parallel with the axis of said axle when said support frame is fixed on said axle;
said magnetic sensor means having means for receiving said post means therein; and
friction means between said post means and said means for receiving said post means whereby
said magnetic sensor means may when said posts means are received in said means for receiving said post means be moved axially by said annular rotor means during installation of said assembly to establish a predetermined axial signal distance therebetween and said friction means will maintain said magnetic sensor means within said predetermined signal distance in alignment with said annular rotor means throughout operation of said assembly.

3,911,303
COPPER COMMUTATOR-ALUMINUM WINDING ARMATURE

Paul Y. Hu; Kenneth N. Karol, both of Boulder; Gary A. Puzo, and Bradford C. Schwartz, both of Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 19, 1971, Ser. No. 173,171
Int. Cl.² H02K *13/04*
U.S. Cl. 310—236 **8 Claims**



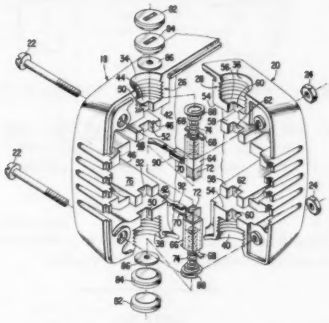
1. An armature for use in a high-torque, low-inertia motor having brushes which directly engage the armature winding aluminum conductors to form a commutation interface, said commutation interface comprising;
commutator segments spanning a length of the aluminum conductors which is greater than the length of said commutation interface to thereby insure a locking overlap of the aluminum conductors when said commutator segments wear to expose the underlying aluminum conductors to the brushes.

3,911,304
BRUSH ASSEMBLY FOR A PORTABLE ELECTRIC TOOL

Robert W. Seely, Easley, S.C., assignor to The Singer Company, New York, N.Y.

Filed June 10, 1974, Ser. No. 477,878
Int. Cl.² H02K *13/00*
U.S. Cl. 310—242 **2 Claims**

1. A brush assembly for a power tool comprising:
a. a clam shell housing having a first housing portion and a second housing portion interconnected to each other to define a mating line therebetween,
b. the clam shell housing formed of dielectric material,
c. a universal motor mounted in the clam shell housing having an armature shaft journaled therein,
d. a commutator affixed to the armature shaft and operatively connected to the motor,
e. a radial brush aperture in superposition to the commutator and being formed at the mating line to extend into both the first and the second housing portions,
f. the brush aperture has a lower section with a slot extending between a pair of spaced shoulders formed in the lower section,
g. the brush aperture has an upper section disposed radially above the lower section, and the upper section formed with threads therein and being externally accessible,
h. one of the shoulders formed at the juncture of the upper and lower sections of the brush aperture,
i. the other shoulder formed on the underside of the lower section of the brush aperture,



j. a metallic tube affixed in the slot of the brush aperture,
k. a pair of spaced transverse tabs formed on the metallic tube, one tab to engage the upper shoulder and one tab to engage the lower shoulder to prevent radial movement of the tube in the brush aperture,
l. means on the tube at the underside of the slot to electrically connect the brush assembly in circuit with the motor,
m. a brush insertable into the brush aperture to be radially slidable in the tube and adapted to operatively engage the commutator,
n. a coil spring carried on the brush, and
o. a cap threadedly connected to the upper section of the aperture to compress the spring and urge the brush to engage the commutator.

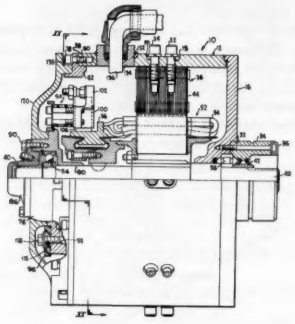
3,911,305
ELECTRIC MOTOR

Arthur L. Lee, 2050 Tremont, Columbus, Ohio 43231

Filed May 9, 1973, Ser. No. 358,724
Int. Cl.² H02K *13/00*
U.S. Cl. 310—241 **5 Claims**

1. An electric motor comprising,
a motor frame having a cylindrical body portion with an annular open end portion and a closed end portion,
an internal end plate secured to said motor frame annular open end portion,
an armature shaft rotatably supported by said internal end plate within said motor frame body portion,
an armature positioned on said shaft with a commutator portion adjacent to said internal end plate,
said internal end plate having a plurality of openings therein,
a brush support ring having a plurality of brush members thereon,
said brush support ring secured to said motor frame in overlying relation to said internal end plate with said brush members extending through said openings in said internal end plate and in abutting relation with said commutator,

said brush support ring with said brush members thereon arranged to be removed from said motor frame while said armature shaft remains rotatably supported by said internal end plate, and



indexing means on said motor frame to position said brushes on said commutator in a neutral position.

3,911,306

HIGH-VOLTAGE VACUUM TUBE, NOTABLY AN X-RAY TUBE, COMPRISING A METAL SLEEVE

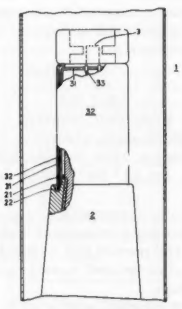
Diethard Peter, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 4, 1974, Ser. No. 430,790

Claims priority, application Germany, Jan. 8, 1973, 2300630

Int. Cl.[2] H01J *35/00*

U.S. Cl. 313—58 **3 Claims**



1. A high-voltage vacuum tube, comprising a cathode which is enclosed by a metal sleeve, the cathode being mounted on a metal base which is mechanically connected to the metal sleeve by way of an insulator, the end part of the insulator near the connection to the metal base being provided with a circular groove which encloses an end portion of a cylindrical metal screen for the electrical screening of the edge of the metal base at the connection to the insulator.

3,911,307

SPARK PLUG

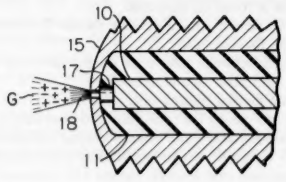
Kenji Goto, and Daisaku Sawada, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed June 27, 1974, Ser. No. 483,537

Claims priority, application Japan, Sept. 5, 1973, 48-99137

Int. Cl.[2] H01T *13/20*

U.S. Cl. 313—143 **7 Claims**



1. A spark plug for electric ignition of a fuel-air mixture, of the type having an outer metal body including a cavity provided with a restricted opening at one end, a central electrode and insulating means for supporting the central electrode in the outer body with a tip of the electrode positioned within the cavity, the outer metal body serving as an outer electrode facing the central electrode via a sparking gap defined between the central electrode and the wall of the cavity, wherein the improvement comprises:

an electric and heat insulator member lining substantially the entire inner wall of the cavity in the outer body from the tip of the central electrode to at least adjacent to the restricted opening for enclosing the sparking gap so that an insulated discharge chamber is defined by said insulator member in conjunction with said central electrode and said outer electrode, said insulated discharge chamber being small enough to be capable of maintaining a sufficiently high temperature to produce plasma-like gas when a spark discharge occurs between both said electrodes, and said restricted opening is at least not larger than the cross section of said discharge chamber to provide a throttling nozzle for enabling said plasma-like gas to jet at high velocity into said fuel-air mixture.

3,911,308

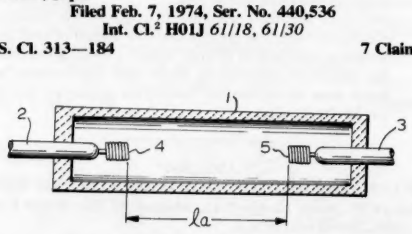
HIGH-PRESSURE METAL-VAPOR DISCHARGE LAMP

Hidezo Akutsu, Ashiya; Haruo Yamazaki, Moriyama; Katsuaki Iwama, Sakai, and Naoki Saito, Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Feb. 7, 1974, Ser. No. 440,536

Int. Cl.[2] H01J *61/18, 61/30*

U.S. Cl. 313—184 **7 Claims**



1. In a high-pressure metal-vapor discharge lamp having a bulb made of a translucent alumina tube and enclosing buffer gas, luminous substances and starting rare-gas, the improvement which comprises said luminous substances being a mixture comprised of a scandium halide selected from the group consisting of scandium iodide, scandium bromide and scandium chloride in the amount of 1.80×10^{-7} to 9.27×10^{-6} gram molecules per 1 cubic centimeter of the inside volume

of the bulb, and free scandium in the amount of at least 3.1 times said amount of scandium halide in atomic ratio.

3,911,309

ELECTRODE COMPRISING A POROUS SINTERED BODY

Ulrich Kümmel, Munich, and Manfred Mair, Augsburg, both of Germany, assignors to Patent-Treuhand-Gesellschaft für elektrische Gluhlampen mbH, Munich, Germany

Filed Sept. 12, 1973, Ser. No. 396,446

Claims priority, application Germany, Sept. 18, 1972, 2245717

Int. Cl.² H01J *1/14, 19/06*

U.S. Cl. 313—346 R **21 Claims**

1. A sintered electrode for discharge lamps adapted to operate with an electric discharge arc appended to an outer surface thereof, comprising a central electrode rod having one portion substantially enclosed by first and second contiguous porous sintered zones each of which has an exposed surface, said exposed surface of the said first zone being positioned in the direction of the arc discharge during operation of the lamp and in closer proximity thereto during operation than said exposed surface of said second zone, said first zone consisting of interconnected porous material refractory sintered at a temperature between 2400°C and 2600°C, and said second zone consisting of a sintered porous mixture of refractory material and emissive material.

3,911,310

PLURAL PHOSPHOR LAYER SCREEN

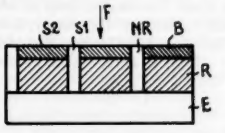
Jean-Pierre Galves, and Paul-Louis Trotta, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 18, 1970, Ser. No. 90,611

Claims priority, application France, Nov. 25, 1969, 69.40588

Int. Cl.² H01J *29/26, 29/30*

U.S. Cl. 313—473 **1 Claim**



1. A luminescent screen for cathode ray tubes which screen exhibits variable persistence when excited with electrons of correspondingly variable energies said screen comprising:

a transparent support and,

a coating disposed on the side of said support adapted for bombardment by said electrons, said coating comprising:

first phosphor means disposed for direct bombardment by said electrons to produce a luminous non-persistent radiation in response thereto,

second phosphor means constituting a different material than said first phosphor means, said second phosphor means emeitting a luminous persistant radiation in response to excitation by electrons and being provided in a larger quantity than said first phosphor means, and

a non-luminescent material means shielding said second phosphor means from said electrons, said non-luminescent material means absorbing said electrons when their energy is lowewr than a predetermined value which value depends upon the thickness of said non-luminescent material, and said non-luminescent material means transmitting said electrons therethrough to excite said second phosphor means when the incident electron energy is higher than said predetermined value,

wherein said second phosphor means is embedded in said non-lluminescent material means and the thus embedded second phosphor means is mixed with said first phosphor means thus forming a continuous layer coating said support.

3,911,311

FIELD DESORPTION ION SOURCE AND METHOD OF FABRICATION

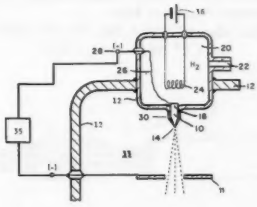
Hans W. Heil, 3880 Rambla Orienta, Malibu, Calif. 90265

Filed June 21, 1974, Ser. No. 481,785

Claims priority, application Germany, July 3, 1973, 2333866

Int. Cl. H01j *27/00*

U.S. Cl. 313—230 **6 Claims**



1. An ion source comprising

means defining a housing enclosing an evacuated space,

means defining a housing containing an ionizable gas, ,

a gas permeable electrode fluidly communicating said evacuated space with said ionizable gas,

a gas impervious coating disposed on said gas permeable electrode where said electrode is exposed to said evacuated space,

means defining an opening in said gas impervious coating exposing a small area of said electrode to said evacuated space,

an extraction electrode disposed in said evacuated space spaced apart from said gas permeable electrode, and

means for raising said gas permeable electrode to a positive electrical potential relative to said extraction electrode in said evacuated space whereby gas molecules permeating through said electrode are ionized at said small area of said gas permeable electrode exposed to said evacuated space.

3,911,312
OXIDE CATHODE FOR AN ELECTRIC DISCHARGE TUBE

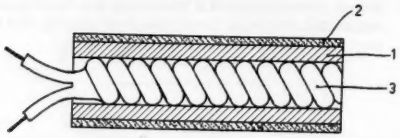
Renier Gertruda Hubertus Coenen, Eindhoven; Karel Martin Hubert Leummens, Nijmegen, and Erland Charles Justus Swaving, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 30, 1974, Ser. No. 474,587

Claims priority, application Netherlands, June 6, 1973, 7307855

Int. Cl.² H01J *1/14, 19/06*

U.S. Cl. 313—346 R **1 Claim**



1. An oxide cathode for an electric discharge tube, comprising a nickel support, a layer of emissive oxides provided on said support, said layer including a mixture of oxides of barium, strontium and calcium, said support being of nickel obtained according to the powder-metallurgical method and including reductors selected from the group consisting of magnesium and carbon, said nickel having the content of impurity selected from the group consisting of silicon, aluminum, titanium and chromium, lower than 0.005 per cent by weight to increase adhesion of said layer to said support.

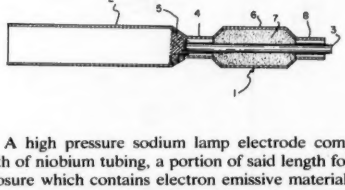
3,911,313
ELECTRODE FOR ARC DISCHARGE LAMP

Francis B. Makar, Jr., Beverly, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed May 17, 1974, Ser. No. 471,071

Int. Cl.² H01J *1/14, 19/06*

U.S. Cl. 313—346 R **4 Claims**



1. A high pressure sodium lamp electrode comprising a length of niobium tubing, a portion of said length forming an enclosure which contains electron emissive material, a tungsten rod extending out of said enclosure and projecting slightly beyond said length of niobium tubing, the interior of said tubing being hermetically sealed at a section thereof intermediate the ends of the tubing.

3,911,314
ION GUN FOR PRODUCTION OF ION BEAMS WITH PARTICULAR RADIAL CURRENT DENSITY PROFILE

Friedrich Schulz, and Klaus Wittmaack, both of Munich, Germany, assignors to Gesellschaft fur Strahlen- und Umweltforschung mbH Munchen, Neuherberg, Germany

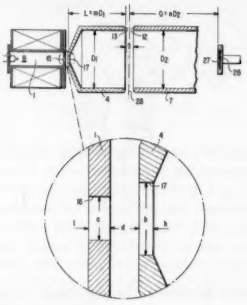
Continuation-in-part of Ser. No. 356,314, May 2, 1973, abandoned. This application Apr. 25, 1974, Ser. No. 464,217

Claims priority, application Germany, Nov. 7, 1972, 2254444

Int. Cl.² H05H *5/00*

U.S. Cl. 313—361 **9 Claims**

1. In an ion gun for production of ion beams with particular current density profile at a target plane intersected by the ion beam axis, the gun including: an ion source of the magnetically confined electron bombardment type with hot cathode, oscillating electrons and ion extraction parallel to the magnetic field through an axially disposed ion source outlet; a cylindrical extraction cup electrode with an entrance aperture facing said ion source outlet and an exit opening opposite to said entrance aperture, the extraction electrode being axially disposed with respect to said ion source, and the target plane being located beyond the extraction electrode; and a cylindrical acceleration tube electrode with an entrance opening facing said exit opening of said extraction electrode, the acceleration electrode being axially disposed with respect to said ion source and said extraction electrode; the improvement wherein: the outlet of said ion source has a length which is



smaller than its diameter; the entrance aperture of said extraction electrode has a diameter which is larger than the diameter of the outlet of said ion source; the axial distance between the outlet of said ion source and said extraction electrode entrance aperture is a function of the ratio of the axial length to the inner diameter of said extraction electrode; the axial distance between said extraction electrode and said acceleration electrode is less than the inner diameters of said extraction and acceleration electrodes; and the axial distance between the target plane and the midplane between said extraction and acceleration electrodes is more than 5 times the inner diameters of said extraction and acceleration electrodes; whereby, the resulting current density profile has a trapezoidal form at the target plane.

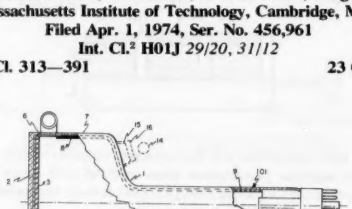
3,911,315
CATHODE RAY TUBE WHOSE IMAGE SCREEN IS BOTH CATHODOCHROMIC AND FLUORESCENT AND THE MATERIAL FOR THE SCREEN

Lee T. Todd, Jr., Lexington, Ky.; Eugene F. Farrell, Lexington, and Arthur Linz, Winchester, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 1, 1974, Ser. No. 456,961

Int. Cl.² H01J *29/20, 31/12*

U.S. Cl. 313—391 **23 Claims**



1. A cathode ray tube that comprises an envelope having a faceplate, a cathodochromic image screen in said envelope,

said cathodochromic image screen comprising a material that has a coloration or F-center as well as a luminescent or fluorescent center so that said material is cathodochromic and is also fluorescent, the coloration or F-center absorption band of said material occurring very close to the emission band of the luminescent of fluorescent center; and means for producing an electron beam to write on the image screen.

3,911,316
REHABILITATIONS TOOL FOR SERIOUSLY PHYSICALLY HANDICAPPED PERSONS INCLUDING MULTIPLEXED SERVO MECHANISMS

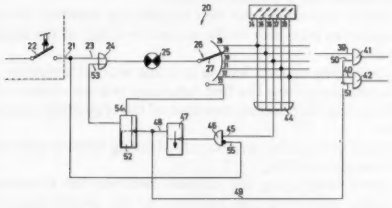
Eberhard Feick, Munich, and Dieter Schmettow, Erlangen, both of Germany, assignors to C. Stiefenhofer, KG, Munich, Germany

Filed Jan. 31, 1974, Ser. No. 438,401

Claims priority, application Germany, Feb. 2, 1973, 2305208

Int. Cl.² G05B *11/32*

U.S. Cl. 318—562 **12 Claims**



6. control apparatus for use by seriously physically handicapped persons, which apparatus comprises first input switch means operable by a handicapped person for an actuation period determined by that person; a stepping pulse generator connected with said first input switch means for operation in response thereto to produce stepping pulses during said actuation period; first selector means operable in stepped manner through a plurality of different conditions connected to said stepping pulse generator and to said first input switch means for operation in response to pulses produced during a· tuation of said first input switch means, said first selector means having a plurality of outputs producing individual signals respectively representing said conditions when extant; a first control device responsive to said input switch means and operable to produce a control signal in response to termination of the actuation period of said apparatus, a plurality of logic gates each having one set of inputs respectively connected with said selector outputs and a second set of inputs connected in common with said first control device, each of said logic gates being operable in response to simultaneous occurrence of the respective ones of said first selector means output signals and said control signal; a plurality of servo devices respectively connected with said logic gates for actuation in response to operation of the respective logic gates; second input switch means operable by a handicapped person for an actuation period determined thereby and connected with said stepping pulse generator for selectively operating the same, second selector means operable in stepped manner through a plurality of different conditions and connected to said second input switch means and said pulse generator for operation in response to said pulses during actuation of said second input switch means, and having a plurality of outputs producing individual signals respectively representing such different conditions when extant; said first control device being responsive to both said first and second input switch means and operable to produce said control signal only in response to termination of the actuation periods of both said first and second input switch means; said logic gates being respectively connected with individually different pairs of one of said first selector means otuputs and one of said second selector means outputs and with said control device, for operation in response to simultaneous occurrence of the respective pair of said selector output signals and said control signal; first and second additional logic gate means each having the inputs thereof connected with said pulse generator and respectively connected with said first and second input switch means, and having the outputs respectively connected with said first and second selector means for applying said pulses to said first and second selector means in respective association with actuation periods of said first and second input switch means; third input switch means operable by a handicapped person for an actuation period determined by that person and connected with said pulse generator to operate the same; a first bistable switch device connected between said third input switch means and said second logic gates to apply said stepping pulses to said first selector means during one stable state of said first bistable switch device and to said second selector means during the other stable state of said first bistable switch device; and a second bistable switch device comprising switchover means connected between each of said input switch means, on the one hand, and said first and second additional logic gate means and said pulse generator, on the other hand, for disconnecting said first and second input switch means and for connecting said third input switch means to said first and second additional logic gates, respectively, during different stable states of said second bistable switch device.

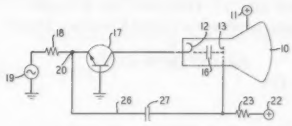
3,911,317
CURRENT BOOTSTRAP TO REDUCE INTERELECTRODE CAPACITANCE EFFECT IN A VACUUM TUBE

James Charles Candy, Convent Station, and Michael Edward Lukacs, Wanamassa, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 24, 1973, Ser. No. 391,458

Int. Cl.² H01J *29/52*

U.S. Cl. 315—30 **11 Claims**



1. In combination,

a cathode ray tube having at least a cathode and an anode between which a ray current flows during tube operation, said tube further having a control grid,

a current path for said ray current external of said tube and including a constant voltage node,

means in said path, and coupled through said node to said cathode, for modulating said cathode ray current,

said tube having an inherent grid-cathode interelectrode capacitance through which a current flows and causes distortion of the effect of said modulating means on said ray current, and

means, separate from said ray current p·th and connected between said control grid and said voltage node, for reducing the effect of said distorting current.

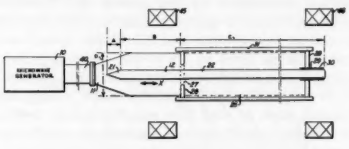
3,911,318
METHOD AND APPARATUS FOR GENERATING ELECTROMAGNETIC RADIATION

Donald M. Spero, Bethesda; Bernard J. Eastlund, Rockville, and Michael G. Urv, Lanham, all of Md., assignors to Fusion Systems Corporation, Rockville, Md.

Division of Ser. No. 239,149, March 29, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,173

Int. Cl.[2] H01J *7/46, 19/80*

U.S. Cl. 315—39 **5 Claims**



1. A microwave generated light source for both producing and emitting light in the visible to ultraviolet region along a substantial length of a longitudinally extending plasma forming medium containing envelope, comprising; a sealed, longitudinally extending plasma forming medium containing envelope, means for exciting said plasma forming medium in said envelope to generate a plasma and produce said light, said means for exciting including:

1. means for generating microwave energy, and
2. microwave chamber means for coupling said generated microwave energy to said plasma forming medium, a part of said chamber means extending in the longitudinal direction of said envelope and surrounding said envelope at least along a substantial portion of the length of the envelope, and at least part of said chamber means being made of a metallic mesh whereby said microwave energy is retained in said chamber means while said light produced along a length of said envelope is emitted out of said chamber means through said mesh.

3,911,319
ELECTRONIC APPARATUS

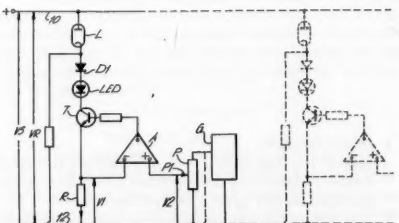
Brian Edward Brown, Challock near Ashford, England, assignor to The Rank Organisation Limited, London, England

Filed May 17, 1974, Ser. No. 471,045

Claims priority, application United Kingdom, May 17, 1973, 23602/73

Int. Cl.[2] H05B *41/00*

U.S. Cl. 315—176 **4 Claims**



1. Hollow cathode lamp circuit means comprising a hollow cathode lamp having an anode and a cathode and a driving circuit for the lamp, said driving circuit comprising

a. diode means having first and second terminals;
b. means connecting the first terminal of the diode means to the cathode of the lamp;
c. d.c. pulsing means;
d. means connecting the d.c. pulsing means to the second terminal of the diode means;
e. means enabling the application of a high striking voltage across the lamp only; and
f. means including a ground line enabling the application of a running voltage, which is lower than the striking voltage, which is across the series circuit comprising the lamp, diode means, and d.c. pulsing means; said d.c. pulsing means including:
g. a square wave generator having an output;
h. a potentiometer having first and second terminals and a pointer output;
i. means connecting the output of the square wave generator to the first terminal of the potentiometer;
j. means connecting the second potentiometer terminal to the ground line;
k. an operational amplifier having first and second outputs and an output;
l. means connecting the potentiometer pointer output to the first input of the operational amplifier;
m. a series regulating transistor having two conducting terminals and a control terminal;
n. means connecting the first conducting terminal of the regulators transistor to the second terminal of the diode means;
o. a balancing resistor having first and second terminals;
p. means connecting the first balancing resistor terminal to the second conducting terminal of the regulating transistor;
q. means connecting the second balancing resistor terminal to the ground line;
r. means connecting the junction between the balancing resistor and regulating transistor to the second input of the amplifier; and
s. means connecting the output of the amplifier to the control terminal of the regulating transistor.

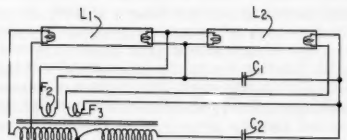
3,911,320
MULTIPLE LIGHTING LEVEL BALLAST FOR FLUORESCENT LAMPS

Joseph A. Crawford, Chicago, and Fred Abrahams, Skokie, both of Ill., assignors to Advance Transformer Company, Chicago, Ill.

Filed Aug. 5, 1974, Ser. No. 494,413

Int. Cl.[2] H05B *41/40, 41/14*

U.S. Cl. 315—240 **9 Claims**



1. A ballast apparatus for starting and operating at least one fluorescent lamp comprising:

a high leakage reactance transformer having a primary winding and a secondary winding;

capacitive reactance means including a first number of series connected capacitors, said first number being greater than one, in series-circuit relationship with said transformer and having a capacitive reactance value to cause a leading current to flow therethrough;

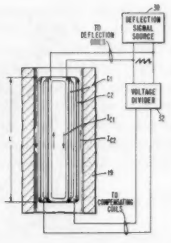
means including electrical leads for extending connections from said transformer and capacitive reactance means to the lamp to form a series circuit therewith when connected thereto; and

switching means coupled to said first number of capacitive reactance means and having a second number of selectable switch positions, said second number being one more than said first number, the fluorescent light level being selectively variable to any one of a second number of light levels when connected as aforesaid whereby the number of light levels which may be obtained is one greater than the number of said series capacitors.

3,911,321
ERROR COMPENSATING DEFLECTION COILS IN A CONDUCTING MAGNETIC TUBE

George A. Wardly, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 202,440, Nov. 26, 1971, abandoned. This application Aug. 27, 1973, Ser. No. 391,120
Int. Cl. H01j *29/70*
U.S. Cl. 315—364 6 Claims

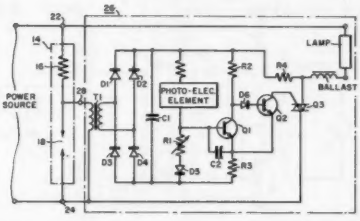


1. In a device utilizing a directionally controlled electron beam including means for generating an electron beam, electromagnetic means for deflecting said beam with a deflecting force at substantially right angles to the direction of said beam, said deflection means including an elongated electrically conductive tube surrounding said deflection means having a radius r_b and a thickness T, a pair of primary deflection coils located within said tube on opposite sides of said electron beam, a pair of secondary compensating coils located within said tube, each coil being located between one of said primary coils and the inner wall of said tube and two of their sides being substantially parallel to the axis of said tube, the conductors comprising at least one axial side of each of the primary and secondary coil pairs lying substantially within the surface of inner and outer cylinders, respectively, having radii r_1 and r_2, means for connecting said two pairs of coils to a common deflection signal source for causing said electron beam to follow a predetermined scan pattern, said deflection and compensating coils being connected so that their respective magnetic fields oppose each other, the ampere turns ratios of said two pairs being such that the magnetic field at the center of the conductive tube due to the primary deflection coils is controlling but wherein the eddy current generation effect in said tube due to the secondary compensating coils opposes the eddy current generation effect due to the primary coils and substantially cancels same, whereby the eddy current generation by the two sets of coils is substantially self-canceling but wherein the deflection field generated by the primary deflection coils is of sufficient magnitude to effect the desired scan pattern by the electron beam.

3,911,322
METHOD AND CIRCUIT ARRANGEMENT FOR AN IMPROVED LOW COST LIGHTNING ARRESTER

Joseph C. Engel, Monroeville, Pa., and Joseph L. Winpisinger, Rocky River, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 5, 1974, Ser. No. 448,311
Int. Cl.² H02H *3/22*
U.S. Cl. 317—16 2 Claims



1. An improved circuit arrangement utilizing a lightning arrester for lightning protection of electrical lamp equipment, said circuit arrangement comprising:

a. first, second and third accessible electrical terminals provided on said lightning arrester, said lightning arrester having as electrical components a resistive element connected between said first terminal and said second terminal and a structure comprising electrodes spaced to provide a spark gap connected between said second terminal and said third terminal and said first terminal and said third terminal being adapted to be connected to the power source;

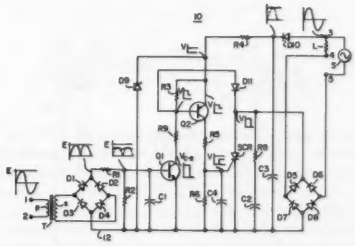
b. solid state lamp control circuitry connected between said second and third terminals; and

c. said lamp is connected between said first terminal and said third terminal.

3,911,323
GROUND FAULT PROTECTOR WITH ARCING FAULT INDICATOR

John T. Wilson, and James C. Wilson, both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 19, 1974, Ser. No. 443,884
Int. Cl.² H02H *3/04*
U.S. Cl. 317—18 R 4 Claims



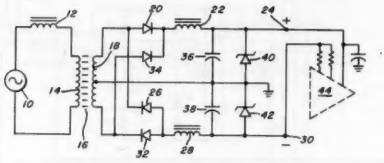
1. A fault indicator for a ground fault detector comprising, sensing means for sensing ground fault current in an electrical circuit and providing an output signal related to said ground fault current without causing interruption of said circuit, non-magnetic indicating means including an input terminal connected to said sensing means for receiving said output signal therefrom, said indicating means providing an indication of the presence of said ground fault current in said electri-

cal circuit before said ground fault current is of a predetermined value sufficient to cause said sensing means to cause said circuit to be interrupted by separate interrupting means.

3,911,324
FAIL-SAFE POWER SUPPLY

Marion M. Bishop, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 16, 1974, Ser. No. 506,162
Int. Cl.[2] H02H *7/10*
U.S. Cl. 317—33 VR **6 Claims**

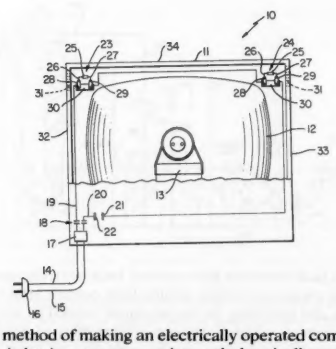


1. In a power supply, the combination of a source of alternating current voltage, a saturable core transformer having primary and secondary windings thereon, means connecting said alternating current supply across said primary winding, a center tap on said secondary winding connected to a point of common potential, positive and negative output terminals for said power supply, and rectifier means connecting opposite ends of said secondary winding to the respective positive and negative output terminals, the arrangement being such that when a short-circuit or current surge occurs between either output terminal and said point of common potential, the core of said transformer will saturate to simultaneously reduce the voltage at both output terminals with respect to said point of common potential.

3,911,325
MEANS AND METHOD FOR PROTECTING AN OVERHEATING COMMUNICATION UNIT

Emil Robert Plasko, Dayton, Ohio, assignor to Micro Devices Corporation, Dayton, Ohio

Division of Ser. No. 321,754, Jan. 8, 1973, Pat. No. 3,833,835. This application June 26, 1974, Ser. No. 483,229The portion of the term of this patent subsequent to Sept. 3, 1991, has been disclaimed.
Int. Cl.[2] H02H *5/04*
U.S. Cl. 317—40 R **2 Claims**

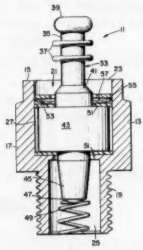


1. In a method of making an electrically operated communication unit having an outer casing and electrically operated means disposed in said casing and being supplied electrical current through power source lines of said unit, the improvement comprising the steps of forming ventilation means through said casing of said unit in an upper part of said casing so that said ventilation means is disposed above said electrically operated means disposing a thermally responsive device in said casing and close to said opening means so that air heated by said electrically operated means will naturally rise therefrom and flow from inside said casing over said device and then immediately out through said opening means, and disposing said thermally responsive device in one of said lines to open that line when said device is heated to a certain amount by a malfunctioning electrically operated means of said unit.

3,911,326
GLOW PLUG

Irwin G. Ohlsson, 27437 Eastvale Road, Rolling Hills, Calif. 90274

Filed Mar. 10, 1975, Ser. No. 556,734
Int. Cl.[2] F23Q *7/10*
U.S. Cl. 317—98 **10 Claims**



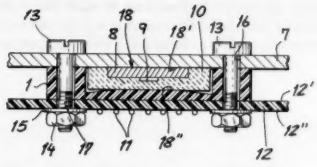
1. A glow plug for igniting combustible vapors, comprising:
an elongated body of electrically conductive material and having a longitudinal axis and a longitudinal bore extending through said body coaxial with respect to said axis, said bore including an increased diameter bore portion;
a center electrode disposed in but spaced from the walls of said bore and including an upper post portion extending beyond said bore, an intermediate increased diameter electrode portion disposed in said increased diameter bore portion, and a lower electrode portion;
a glow element attached to said lower electrode portion and to the lower portion of said body;
insulation means including electrical insulation material disposed in said increased diameter bore portion at least above and below said increased diameter electrode portion for electrically insulating said center electrode from said body; and
compression means including a spring washer disposed about but spaced from said center electrode and in said increased diameter bore portion for providing a generally constant compression force between said increased diameter electrode portion and the upper and lower walls of said increased diameter bore portion and permanently preventing gas under pressure located in the lower portion of the bore from passing about the increased diameter electrode portion to the upper portion of the bore, and the upper end of said body adjacent said longitudinal bore includes an inwardly extending crimped lip portion defining the circular upper wall of said increased diameter bore portion.

3,911,327

MOUNTING ASSEMBLY FOR INTEGRATED CIRCUITS HEAT SINK AND CLAMP MEANS

Bruno Murari; Giuseppe Cossuta, and Sergio Orsucci, all of Milan, Italy, assignors to SGS ATES Componenti Elettronici SpA, Milan, Italy

Filed July 17, 1974, Ser. No. 489,172
Claims priority, application Italy, July 19, 1973, 26760/73
Int. Cl. H05k *7/20*
U.S. Cl. 317—100 **9 Claims**



1. A semiconductor circuit board assembly comprising:

an integrated-circuit package having a pair of opposite sides;

a heatsink plate engaged with one of said sides and provided with apertures;

a synthetic-resin flexible spacer body having a face and unitarily formed with a pair of end regions having a predetermined height above said face and with a central region extending between said end regions and having a maximum height above said face smaller than the height of said end regions by a distance at most equal to the thickness of said package between said sides, each end region being formed with a throughgoing bore at said face, said package being located in said central region between said sides;

a circuit board formed with holes aligned with said bores; and

clamping means extending through said apertures, said bores and said holes, thereby gripping said end regions between said heatsink plate and said circuit board and thereby pressing said package with said central region against said heatsink plate.

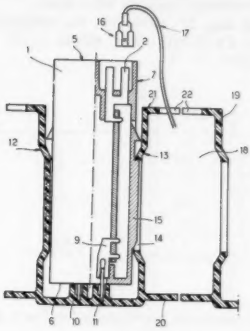
3,911,328

SYSTEM PROVIDING POWER SUPPLY CONNECTIONS AND INTERCONNECTIONS FOR LOGIC MODULES

Andre Lucien Haury, Le Raincy, and Michel Louis Duclos, Verneuil L'Etang, both of France, assignors to La Telemecanique Electrique, Nanterre, France

Filed Jan. 9, 1974, Ser. No. 432,127
Claims priority, application France, Jan. 16, 1973, 73.01388
Int. Cl. H02b *1/04;* **H05k** *5/02*
U.S. Cl. 317—118 **2 Claims**

1. A control system for automated industrial equipment, said system comprising a support member provided with a plurality of parallel socket-like elongated channels of substantially U-shaped cross-section, a plurality of logic modules detachably mounted on said channels, power supply conductors and interconnecting conductors, each of said logic modules having first and second end faces and first and second side walls, first connecting members fixedly mounted on said first end faces and detachably attached to the power supply conductors, second connecting members fixedly mounted on said second end faces and detachably attached to the interconnecting conductors, positioning and clamping means on said first side walls, each of said socket-like elongated channels having a bottom and first and second resilient side limbs, each of said side limbs having inner and outer surfaces, a bottom end and an upper end, wall portions projecting from the bottom end and from the upper end of each side limb substantially perpendicular thereto, said power supply conductors being fixedly mounted in the bottom of the channels, further positioning and clamping means on the inner surfaces of said first limbs, said further positioning and clamping means cooperating with the positioning and clamping means of the logic modules, the



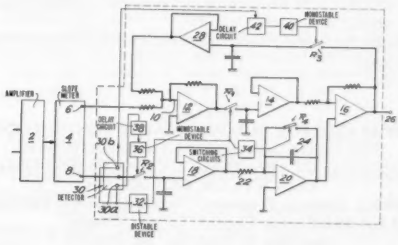
said projecting wall portions of each channel cooperating with the projecting wall portions of other channels to form a substantially closed duct wherein the said interconnecting conductors are grouped together.

3,911,329

DEVICE FOR CUMULATING THE USEFUL SECTIONS OF A SIGNAL APPEARING IN THE FORM OF A SERIES OF PULSES EACH HAVING A USEFUL SECTION

Claude Charles Marc Conraux, Strasbourg; Alain Despringre, St-Ismier; Gerard Kaphan, Marseille, and Jacques Max, St-Egreve, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 28, 1974, Ser. No. 474,103
Claims priority, application France, June 6, 1973, 73.20611
Int. Cl.[2] A61B *5/10;* **G06G** *7/18;* **H03K** *5/00*
U.S. Cl. 328—14 **3 Claims**



1. A device for cumulating the useful sections of an electrical signal which appears in the form of a series of pulses each having a useful section and a non-useful section, said device producing a cumulated signal S_n comprising

means for producing a voltage which is proportional to the mean value of the slope of the useful section of the n^{th} pulse of the signal and for integrating said voltage during the time interval of the non-useful section of the n^{th} pulse producing a signal I_n,

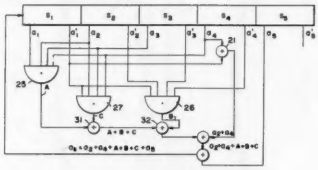
means for adding the useful section of the n^{th} pulse to the value of a cumulated signal S_{n-1} at the end of the $n-1$ pulse producing a signal P_n which represents the cumulated signal during this interval of time, and

means for superposing the signals P_n and I_n, producing the cumulated signal Sn corresponding to the time of the non-useful section of the n pulse.

3,911,330
NONLINEAR NONSINGULAR FEEDBACK SHIFT REGISTERS

James C. Fletcher, Adminstrator of the National Aeronautics and Space Administration, with respect to an invention of and Marvin Perlman, Granada Hills, Calif.

Filed Aug. 27, 1974, Ser. No. 501,012
Int. Cl.[2] G11C *19/20;* **H03K** *23/00*
U.S. Cl. 328—37 **20 Claims**



1. An r-stage nonlinear nonsingular feedback shift register comprising:

a binary shift register of r stages, arranged in a sequence from 1 to r where $r \geq 5$, each stage having an assertion output which is at an enabling level when the state is at a first binary level definable as a 1, and a negation output which is at an enabling level when the stage is at a second binary level, definable as a 0;

feedback means including a first ANd gate for providing an output which is the AND function of the assertion outputs of all the first $(r-1)$ stages, a second AND gate for providing an output which is the AND function of the negation outputs of all the first $(r-1)$ stages, a third ANd gate for providing an output which is the AND function of the outputs of the first $(r-1)$ stages, one output per stage, where at least one output is an assertion output and at least one output is a negation output, and modulo-2 summing means for providing a feedback output which is the modulo-2 sum of the outputs of said first through third AND gates and the assertion outputs of stages defined by the exponents of terms in a characteristic polynomial $f_e(x)\ \phi_{r-1}(x)$, where $\phi_{r-1}(x)$ represents a primitive polynomial of degree $r-1$; and

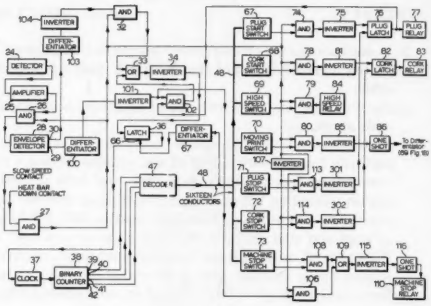
means for feeding back said feedback output to said first stage.

3,911,331
APPARATUS FOR AUTOMATICALLY CONTROLLING THE INITIATION AND/OR TERMINATION OF FUNCTIONS OF APPARATUS OR PROCESSES USING A CLOCK PULSE GENERATOR

Patrick J. Jamieson, Bramalea, Canada, assignor to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Filed Sept. 9, 1974, Ser. No. 504,549
Int. Cl.[2] H03K *17/00*
U.S. Cl. 328—75 **15 Claims**

1. Apparatus for controlling both the initiation and termination of at least one function in timed relationship to the occurrence of an event comprising a clock pulse generator for providing, when activated, a train of clock pulses which occur one after the other in sequential spaced apart relationship; means responsive to the occurrence of either of at least two different events for activating said clock pulse generator; means having a plurality of output terminals for translating said train of clock pulses into a plurality of pulse signals that are derivable from individual ones of said output terminals, one such pulse signal being derivable at each of said output terminals and the pulses of different ones of said pulse signals occurring at different points in time; at least two networks, connecting means connecting said networks to at least one of said output terminals, said two networks including a common two state device, said two state device controlling the initiation and termination of one said function, said two state device initiating said one function when said state thereof changes from one state to a second state and terminating said one function when said state thereof changes from said second state to said one state, said two state device being responsive to the supply of a pulse thereto via either of said networks and derived from a pulse occurring at said at least one of said output terminals to which said networks are connected for changing said state thereof; means responsive to the occurrence of one of the events that activates said clock pulse generator for rendering, for the duration of the count of said clock pulse generator in response to said one event, one of said networks incapable of supplying a pulse derived from any pulse occurring at said at least one of said output terminals to said two state device and for enabling the other of said networks to supply a pulse derived from a pulse occurring at said at least one of said output terminals to said two state device to change said state of said two state device from said one state to said second state thereof; and means responsive to the occurrence of the other of said events that activates said clock pulse generator for rendering, for the duration of the count of said clock pulse generator in response to said other event, said other network incapable of supplying a pulse derived from any pulse occurring at said at least one of said output terminals to said two state device and for enabling said one network to supply a pulse derived from a pulse occurring at said at least one of said output terminals to said two state device to change said state of said two state device from said second state to said one state thereof.



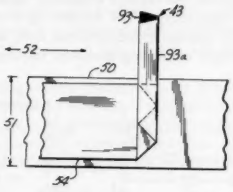
3,911,332
WOUND TRANSFORMERS AND MACHINE FOR MAKING THE SAME

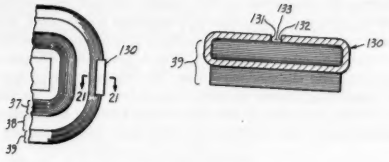
George M. Kunkel, 8402 McGroarty, Sunland, Calif. 91040

Continuation-in-part of Ser. No. 213,337, Dec. 29, 1971, abandoned. This application Dec. 11, 1972, Ser. No. 313,847
Int. Cl. H01f *15/10, 27/33, 27/38*
U.S. Cl. 317—157.62 **54 Claims**

45. In a wound transformer winding wherein metallic foil material is utilized as a conductor, a terminal for said winding comprising an end portion of said foil material folded to project laterally beyond the transformer winding, the projecting portion being multiply folded, whereby to form a plurality of dorsal folds extending longitudinally along the projecting portion to form a monolithic structure to provide a conductive connection for said conductor.

53. In a wound transformer having a plurality of windings, an impedance member respective to only one of said windings





comprising a body of magnetizable material embracing in a radial plane at least a portion of only that winding.

3,911,333

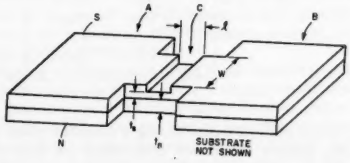
MULTILAYERED THIN FILM SUPERCONDUCTIVE DEVICE, AND METHOD OF MAKING SAME

Harris A. Notarys, Pasadena, and James E. Mercereau, South Laguna, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 338,907, March 7, 1973, Pat. No. 3,798,511. This application Nov. 5, 1973, Ser. No. 412,761 The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl. H03k *3/38*

U.S. Cl. 357—5 **21 Claims**



1. A superconducting thin film structure exhibiting quantum phenomena comprised of superimposed thin films of selected metals at least one of which is superconducting below a predetermined temperature, said thin film structure being separated into two parts by a thin line region of dimension *l* in the direction of current flow from one part to the other, said region having a ratio of thickness of at least one superconductive film to the thickness of the remaining thin films in said thin line region less than a corresponding ratio of thickness in the adjoining parts of said structure.

3,911,334

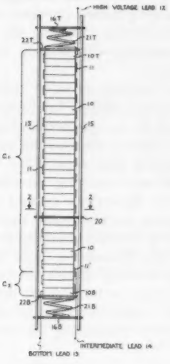
POTENTIAL MEASURING CAPACITOR

Stanier E. Brayshaw, and Alan J. Knapp, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Nov. 12, 1974, Ser. No. 523,040

Int. Cl.² H01G *1/11*

U.S. Cl. 317—247 **7 Claims**



1. An improved capacitor for use with high voltage lines and the like, comprising:

a. an elongated structure for said capacitor;

b. a plurality of individual capacitors stacked within said structure, said plurality of individual capacitors being electrically connected in series to provide the desired voltage characteristic;

c. leads respectively connected to the top capacitor of said series, an intermediate point in said series, and the bottom capacitor of said series for external electrical connections;

d. and a mechanical barrier positioned within said structure between two of said individual capacitors at a location above said intermediate point for supporting the capacitors above said mechanical barrier so that the capacitors below said mechanical barrier receive no pressure from said capacitors above said mechanical barrier.

3,911,335

METHOD OF AND APPARATUS FOR FORMING ELECTROSTATIC LATENT IMAGES

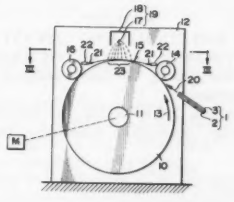
Isoji Takahashi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 4, 1974, Ser. No. 503,058

Claims priority, application Japan, Sept. 7, 1973, 48-100827

Int. Cl.² H01T *19/00*

U.S. Cl. 317—262 A **11 Claims**



3. Apparatus for forming an electrostatic latent image on an image forming member composed of a substrate at least the

surface of which is insulating and a conductive layer deposited thereon, said conductive layer being removed to form recessed portions having an insulating bottom surface in the shape of the image desired to be obtained and form a plurality of eiectrically isolated conductive parts on the substrate, comprising in combination;

a feeding means for feeding the image forming member through a predetermined passage,

a corona charging means provided on the way of said passage for uniformly charging the surface of the image forming member with corona ions when the member passes thereby,

a conductive backing member provided opposite to said corona charging means for supporting the back of said substrate of the image forming member when the image forming member passes by the corona charging means,

a first grounding means provided between said charging means and said backing member to be brought into contact with the surface of said conductive layer of the image forming member when the image forming member passes by the corona charging means for grounding the surface of the conductive layer, and

a second grounding means provided downstream said charging means to be brought into contact with the surface of the conductive layer of the image forming member for further grounding the surface of the conductive layer.

3,911,336

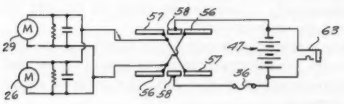
PLURAL MOTOR DRIVE INCLUDING A SERVO MOTOR CONTROL SYSTEM

Thomas M. Diggs, 1349 Otis St. NW, Washington, D.C. 20017

Filed Feb. 1, 1974, Ser. No. 438,642

Int. Cl.[2] H02P *5/46*

U.S. Cl. 318—48 **5 Claims**



1. A servo motor control system comprising a reversable electric motor drive, longitudinally reciprocating means driven by said electric motor drive for connection to an object to be move, a first switch element mounted on said means and moveable longitudinally therewith, a servo motor control member mounted on said means and longitudinally moveable with respect to said means, a second switch element mounted on said motor control member for movement therewith, at least one of said switch elements having a pair of longitudinally spaced contacts and the other of said switch elements having a contact for selective engagement with said space contacts and means extending from said switch elements for energizing a forward or reverse circuit to said electric motor drive corresponding to the movement of said servo motor control.

3,911,337

DRIVING AND STABILIZING CIRCUIT FOR AN ELECTRO-MECHANICAL OSCILLATOR

Erich Gerum, Nuremberg, Germany, assignor to Diehl, Nuremberg, Germany

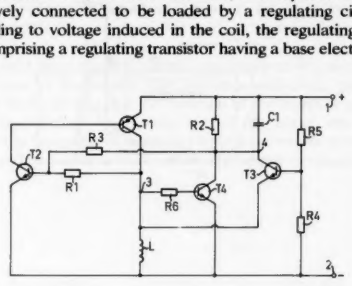
Filed Jan. 23, 1975, Ser. No. 543,451

Claims priority, application Germany, Jan. 29, 1974, 2404135

Int. Cl.[2] H02K *33/10*

U.S. Cl. 318—130 **14 Claims**

1. A driving and stabilizing circuit for a single coil electromechanical oscillator especially for the rate regulator of a time-piece, the single coil being connected between the terminals of a d.c. supply voltage in series relation to the collector-emitter electrodes of an operating transistor, the operating transistor being operatively switched between a conductive and nonconductive condition by a control transistor, said circuit including a storage capacitor preceding the control input terminal of the control transistor, said capacitor being operatively connected to be loaded by a regulating circuit responding to voltage induced in the coil, the regulating circuit comprising a regulating transistor having a base electrode



connected to receive a bias voltage from a voltage divider between the terminals of the supply voltage and having an emitter electrode operatively connected to the coil, and an additional regulating means having a control input operatively connected to the coil and having a controlled output connected to the storage capacitor, the regulating transitor and the regulating means thereby responding variably to voltage conditions occurring in the circuit and tending to stabilize the oscillations of the oscillator in amplitude and frequency.

3,911,338

CURRENT CONTROL CIRCUIT FOR A PLURALITY OF LOADS

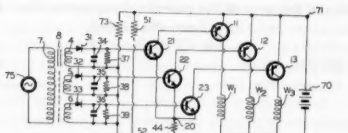
Yoshiaki Igarashi, Kadoma; Kazutsugu Kobayashi, Takatsuki, and Hisayuki Matsumoto, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma and Wireless Research Lab, Osaka, both of, Japan

Division of Ser. No. 154,548, June 18, 1971. This application Nov. 13, 1972, Ser. No. 305,830

Claims priority, application Japan, June 26, 1970, 45-56342; June 26, 1970, 45-56344

Int. Cl.[2] H02P *7/06*

U.S. Cl. 318—138 **2 Claims**



1. A direct current motor having a magnetic rotor and an electronic control circuit for controlling the load current flowing through a plurality of stator windings, comprising:

a plurality of current amplifying means to operate in a non-saturating mode and being coupled to respective stator windings, each supplying a load current to a corresponding one of said stator windings;

current detecting means coupled to the outputs of the stator windings for detecting a magnitude of a current;

reference signal means for generating a reference signal;

comparator means coupled to said current detecting means and said reference signal means for providing an output of said current detecting means and said reference signal;

amplifying means coupled to said comparator means for amplifying said output signal of said comparator means;

a plurality of switching means coupled between said amplifying means and the respective current amplifying means for selectively controlling the inputs to said current amplifying means, whereby said plurality of stator windings are selectively energized by a current, the instantaneous magnitude of which is proportional to said reference signal at a constant rate, regardless of the differences in the gains of said current amplifying means; and

position detecting means producing a set of position signals to indicate the rotary position of said rotor relative to said stator windings, said position detecting means being coupled to said plurality of switching means so that one of said plurality of switching means is selectively switched on.

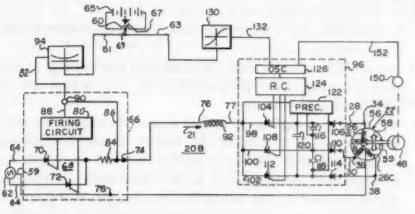
3,911,339
METHOD FOR CONTROLLING THE OUTPUT CONDITION OF A SYNCHRONOUS RELUCTANCE MOTOR

Charles E. Rettig, Brookfield, Wis., assignor to Litton Industrial Products, Inc., Milwaukee, Wis.

Continuation of Ser. No. 337,281, March 2, 1973, abandoned, division of Ser. No. 82,302, Oct. 20, 1970, abandoned. This application Oct. 18, 1974, Ser. No. 515,937

Int. Cl.² H02P *5/34*

U.S. Cl. 318—171 **11 Claims**



1. A method of producing a desired torque condition in a synchronous reluctance motor, said torque being produced by the interaction of a quadrature axis flux and a direct axis flux, said motor including a stator winding energized by a phase displaceable stator current having a frequency characteristic and a salient pole rotor, the rotary condition of which is definable in terms of a rotor frequency which is referenced to the stator winding, said method comprising the steps of:

a. providing an adjustable stator current for the motor;

b. sensing the existing rotor frequency of the rotor;

c. establishing the frequency of the stator current responsive to the sensed rotor frequency to a value equal to the value of the existing rotor frequency under all operating conditions of the motor;

d. altering the magnitude of the stator current responsive to the sensed rotor frequency to a value prescribed solely as a predetermined function of the desired motor torque condition when the quadrature axis flux appears so that the direct axis flux remains constant relative to the desired motor torque condition regardless of the voltage condition of the synchronous reluctance motor to permit motoring and regenerative operation of the motor; and

e. concurrently establishing the phase displacement of the stator current at a predetermined displacement angle prescribed solely as a predetermined function of the desired motor torque condition,

f. the concurrent predetermined establishment of the stator current magnitude and phase angle values being such as to tend to fix the direct axis flux of the motor at a desired level while generating a predetermined torque producing quadrature axis flux and the desired torque condition in the motor.

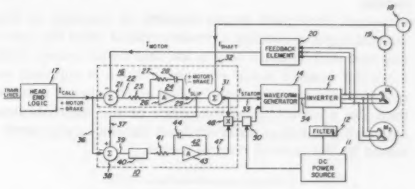
3,911,340
METHOD AND APPARATUS FOR AUTOMATIC IR COMPENSATION

Allan Barr Plunkett, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Oct. 1, 1973, Ser. No. 402,253

Int. Cl.² H02P *7/41*

U.S. Cl. 318—230 **23 Claims**



1. A flux regulator for an a-c induction motor having a variable frequency, variable voltage power input comprising:

a. means for providing a call signal representative of desired motor current;

b. means coupled to said motor for deriving a feedback signal representative of sensed motor current;

c. means for generating a slip frequency signal representative of the motor slip frequency at which said feedback signal tends substantially to equal said call signal over a given range of said variable frequency;

d. means responsive to the relative values of said call signal and said slip frequency signal for deriving a signal representative of the motor flux which is desired to maintain a predetermined substantially constant ratio of said call signal to said slip frequency signal; and

e. means for varying motor voltage amplitude as a function of said desired motor flux signal, thereby maintaining a substantially constant motor flux.

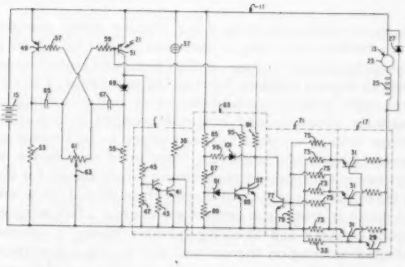
3,911,341
SWITCHING TYPE MOTOR SPEED CONTROL

Daniel P. Carlson, Toledo, Ohio, and James T. Hardin, Lambertville, Mich., assignors to Eltra Corporation, New York, N.Y.

Filed Sept. 20, 1974, Ser. No. 507,898

Int. Cl.² H02P *5/34*

U.S. Cl. 318—341 **4 Claims**



1. A circuit for controlling the speed of a DC motor, comprising:

a free running multivibrator alternately providing first and second control signals at a substantially constant predetermined frequency and with a time ratio determined by the duty cycle of the multivibrator,

switch means for connecting the motor to a source of direct current and being electrically conductive in response to said first control signal and electrically nonconductive in response to said second control signal for supplying energy to said motor in a succession of voltage pulses

corresponding to the predetermined frequency of said multivibrator and having a duration determined by the duty cycle of said multivibrator,

manual control means for selectively varying the duty cycle of said multivibrator to control the average voltage being supplied to the motor,

current sensing means providing a current signal indicative of the current being supplied to the motor by said switch means,

overcurrent protection means operable in response to the current signal exceeding a predetermined value for resetting said multivibrator to provide said switch means with a second control signal whereby voltage is supplied to said motor in a succession of pulses at a frequency greater than the predetermined frequency of the multivibrator and with a duration different from the duty cycle determined by the manual control means.

3,911,342

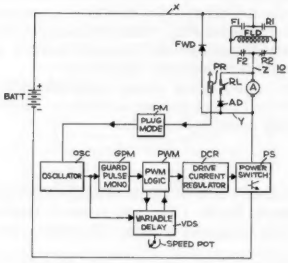
PLUG CURRENT SENSOR FOR TRACTION MOTOR

Warren E. Herwig, Wind Lake, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 5, 1974, Ser. No. 494,841

Int. Cl.[2] H02P *3/12*

U.S. Cl. 318—373 **9 Claims**



1. In a vehicle driven by a d.c. traction motor energized from a battery and having a time-ratio control for selectively varying the average voltage applied from said battery to said motor to thereby regulate the speed of said motor, a diode in shunt to the inductive path of said motor, and motor plugging means for actuating said time-ratio control to reduce the average voltage supplied by said battery to said motor and thereby dynamically brake the rotation of said motor, the improvement comprising plug current sensor means for sensing the magnitude of current flowing through said diode when said motor is acting as a generator including a ferromagnetic current carrying and shielding member having a generally U-shaped indentation therein and also having a constricted neck portion of reduced cross section defining one of the walls of said U-shaped indentation and being connected in series with said diode so that the current through said diode also flows through said neck portion and a reed switch having a hollow casing of insulating material enclosing a pair of cooperable contacts movable to make and break an electrical circuit and being adapted to control said motor plugging means and to operate said contacts when disposed in a magnetic field of predetermined magnetic flux density, said reed switch being positioned in said indentation adjacent said neck portion so that it is within the magnetic field generated by current flowing through said neck portion.

3,911,343

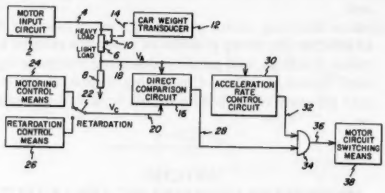
ACCELERATION CONTROL SYSTEM FOR ELECTRICALLY PROPELLED TRACTION VEHICLES

Lloyd Robert Oster, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Oct. 17, 1973, Ser. No. 407,296

Int. Cl.[2] H02P *5/06*

U.S. Cl. 318—392 **10 Claims**



1. In a control system for propulsion motors of a vehicle wherein a first signal representative of a sensed motor parameter which is a function of motor torque, such as motor current, and a control signal representative of desired vehicle acceleration are applied to the inputs of comparison means whose output actuates switching means controlling the propulsion motor circuit so as to maintain desired vehicle acceleration, the combination comprising:

a. a source of said first signal whose magnitude is directly proportional to propulsion motor current;

b. a source of said control signal;

c. a resistance network comprising a potentiometer having a potentiometer arm;

d. means for automatically maintaining the setting of said potentiometer arm proportional to the actual loaded weight of said vehicle;

e. means for coupling said first signal through said resistance network to one of the inputs of said comparison means such that the signal applied to said one input has a magnitude proportional to the magnitude of the first signal divided by the actual loaded weight of the vehicle and for coupling said control signal directly to another input of said comparison means, so that the first and control signals upon comparison are ratioed in respect to each other proportionately to the actual loaded weight of the vehicle.

3,911,344

CONTROLLING SYSTEM IN PROTECTIVE DEVICES OF PHOTOCELL TYPE FOR PRESSES AND THE LIKE

Lars Erik Svensson, Tullinge, Sweden, assignor to Safer Marketing Aktiebolag, Stockholm, Sweden

Filed Dec. 18, 1973, Ser. No. 425,913

Claims priority, application Sweden, Dec. 21, 1972, 16838/72

Int. Cl.[2] G02F *1/28;* **H02H** *7/08*

U.S. Cl. 318—480 **11 Claims**

1. A control system for operating presses and the like of the type having a path for insertion and removal of work pieces, comprising:

a motor operated protective shutter moveable into and out of said work piece insertion and removal path;

a light curtain incorporating a photocell device and defining a light controlled area transversely in said path and on the operator's side of said shutter;

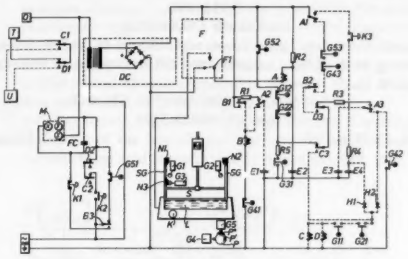
shutter circuit means connected to and controlled by said photocell device for initiating operation of the shutter motor to close said shutter;

shutter contact means actuable by said shutter upon such closure thereof;

press releasing circuit means responsive to said actuation of said shutter contact means for starting said press;

timing means in circuit with said shutter circuit means and actuable upon said removal of an interrupting object from

said light curtain for timing a short period of time during which closure of said shutter must be initiated;

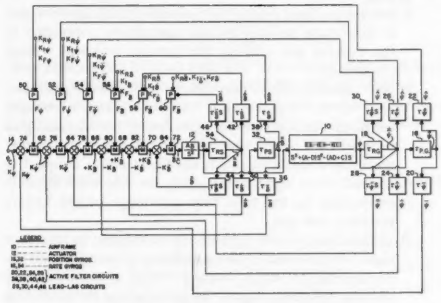


and further timing means in circuit with said press releasing circuit means for timing a period during which press operation must be initiated.

3,911,345
ADAPTIVE CONTROL SYSTEM USING COMMAND TAILORING

Donald R. Totten, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 4, 1973, Ser. No. 367,086
Int. Cl.² G05B *13/00*
U.S. Cl. 318—561 **9 Claims**



1. An adaptive control means for a feedback control system in which at least one system function is varied by said adaptive control means to optimize the response of said system to a control input under widely varying operating conditions, said adaptive control means comprising:

a. an airframe having controllable functions,

b. command control input means for commanding a change in at least one of the controllable functions,

c. reference signal means representing limits of said controllable functions,

d. sensing means providing output signals representing the actual response of said airframe to said command control input means,

e. means comparing said output signals with said command control input means for producing an error signal,

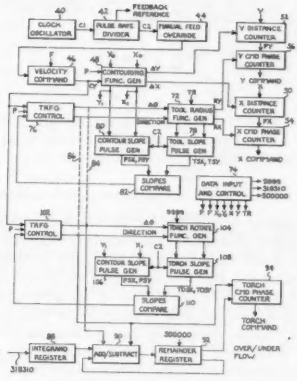
f. means comparing said output signal means with said reference means for providing a control signal,

g. means coupled to said error signal producing means and to said control signal providing means and being responsive to said control signal to prevent said error signal from effecting a change that would exceed the limits of said controllable functions.

3,911,346
NUMERICAL CONTOURING CONTROL FOR A FLAMECUTTING TOOL

Ulrich Schneekloth, Waynesboro, Va., assignor to General Electric Company, Salem, Va.

Filed Aug. 20, 1974, Ser. No. 498,938
Int. Cl.² G05B *19/22*; **B23B** *3/36*
U.S. Cl. 318—567 **3 Claims**



1. A numerical contouring control for producing relative motion between a flamecutting tool and a workpiece along a path and for maintaining a fixed angle between an axis of the flamecutting head and the path direction comprising:

a. input information means for commanding the speed of said relative motion and first and second directional components of the commanded path to be followed along respective axes;

b. a clock oscillator for synchronizing system operation;

c. a velocity command generator coupled to the input information means and the clock oscillator for producing contouring velocity pulses at a rate indicative of the speed of said relative motion;

d. a contouring function generator coupled to the velocity command generator and the input information means for resolving the contouring velocity pulses into the first and second components of pulses having respective rates which indicate the direction of the commanded path relative to axes;

e. control means coupled to the velocity command generator and the information means for generating a train of pulses wherein each pulse represents an incremental angular change of the path direction and a signal indicating the direction of angular change;

f. means responsive to the first component of pulses for effecting movement along one of said two axes;

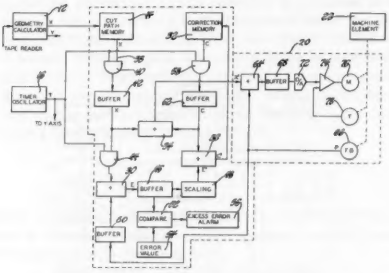
g. means responsive to the second component of pulses for effecting movement along the other of said two axes; and

h. means responsive to the angular change pulses and the angular direction signal for effecting rotation of the flamecutting head.

3,911,347
ADAPTIVE CONTROL SYSTEM

Dudley B. Hartung, Somerville, Mass., assignor to Xenex Corporation, Woburn, Mass.

Continuation of Ser. No. 236,239, March 20, 1972. This application Oct. 9, 1973, Ser. No. 404,846
Int. Cl. G05d *23/275*
U.S. Cl. 318—632 **15 Claims**

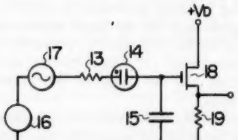


1. The method of reducing the deviation of a member from a desired path in plural successive excursions of the path, said path being made up of plural successive increments, said method comprising, for each successive increment of the path, the steps of; controlling the motion of the member during the excursion of a given interval in accordance with the value of the desired motion, measuring during each one of the plural successive excursions of said given interval the difference between the desired motion and the actual motion, storing at the end of each excursion of the given interval a correction value corresponding to the difference between the desired motion and the actual motion for the given interval, and correcting the value of the desired motion for the next excursion of the given interval in accordance with the stored correction value which was stored for the given interval during the previous excursion of said given interval by said member, said method also comprising, for each excursion of said path, the step of repeating the aforesaid steps thereby updating the correction values on each path excursion.

3,911,348
ELECTRIC CHARGE HOLDING DEVICE

Takehide Takemura, Hirakata, and Shunji Minami, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 20, 1974, Ser. No. 443,998
Claims priority, application Japan, Feb. 20, 1973, 48-22300; Feb. 20, 1973, 48-22301; Feb. 20, 1973, 48-22302
Int. Cl.[2] H02J *15/00*
U.S. Cl. 320—1 **7 Claims**

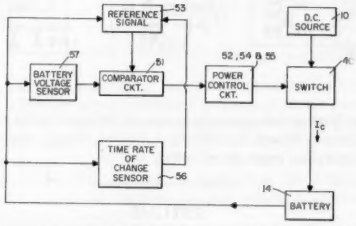


1. An electric charge holding device comprising a capacitor, a resistor and a discharge tube connected in series; means for superimposing upon said series circuit an arbitrary voltage having a d.c. component for charging said capacitor; means for superimposing upon said series circuit an alternating voltage for driving said discharge tube into its conductive state, said arbitrary voltage having a magnitude not greater than the discharge voltage of said discharge tube and said alternating voltage having an amplitude not less than said discharge voltage; and output means coupled across said capacitor for providing an output voltage.

3,911,349
BATTERY CHARGER

Ronald G. Seeley, Brick Town, and William H. Seeley, Keansburg, both of N.J., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Nov. 7, 1974, Ser. No. 521,667
Int. Cl.[2] H02J *7/04*
U.S. Cl. 320—20 **8 Claims**



1. In a battery charger, including:

1. current supply means for providing direct current, and;

2. controllable switch means for supplying direct current to the battery when the switch is closed for charging the battery and for interrupting the direct current to the battery when the switch is open, the improvement comprising:

a. reference signal means for providing a reference signal;

b. amplitude sensing means operatively connected to the battery for sensing the battery terminal voltage amplitude;

c. rate sensing means operatively connected to the battery for sensing the time rate of change of battery terminal voltage and for generating an output signal proportional to the time rate of change of the battery terminal voltage, said output signal being coupled to the reference signal and varying the reference signal in proportion to the time rate of change of the battery terminal voltage;

d. comparator means operatively connected to reference signal means and to the amplitude sensing means for comparing the sensed battery voltage amplitude to the varying reference signal, the comparator means having a two-state output that is dependent on whether the sensed battery voltage amplitude is greater or lesser than the varying reference signal; and

e. means for sensing the state of the output of the comparator means for closing said switch means in one of the states and opening said switch means in the other state of the comparator means.

3,911,350
DUAL BATTERY CHARGING RATE DEVICE

Thelbert A. Swope, Brookpark, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 9, 1973, Ser. No. 349,383
Int. Cl.[2] H02J *7/00*
U.S. Cl. 320—22 **26 Claims**

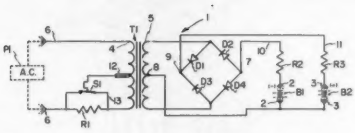
1. An automatic dual charging rate switching device for secondary cells and batteries which is capable of delivering an initial fast charging current followed automatically by a lower charging current comprising:

a. a transformer having primary and secondary windings coupled to at least one primary and at least one secondary, set of terminals, respectively;

b. a resistive element connected in series with one of said terminal sets;

c. a thermal switching means having at least one switching component and a thermal sensing component, one of said switching component connected in parallel across said resistive element, and said thermal sensing component positioned adjacent said transformer, said transformer operable such that the temperature of the transformer will increase between about 30°F. and about 90°F. after a time period of in line operation between about 20 minutes and about 45 minutes;

d. rectifier means connected to at least one set of secondary terminals of the transformer for converting alternating current from said transformer to direct current; and



e. output terminals for the rectifier means which are adapted for connecting to at least one secondary cell or battery so that when at least one secondary cell or battery is coupled to said output terminals and an alternating current power source is coupled to the primary terminals of the transformer, the secondary cell or battery will receive an initial fast charging current until the temperature of said transformer increases to within the above temperature range which will cause said thermal sensing component to activate said switching component thereby altering the parameters of the circuit so as to decrease the charging current through the output terminals to a lower charge rate.

3,911,351

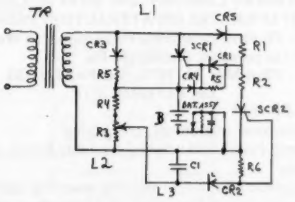
BATTERY CHARGING PROTECTIVE CIRCUIT FOR USE IN CHARGING NICKEL CADMIUM BATTERIES

Seymour Saslow, Saratoga Springs, N.Y., assignor to Espey Mfg. & Electronics Corporation, Saratoga Springs, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,782

Int. Cl.² H02J *7/10*

U.S. Cl. 320—39 **1 Claim**



1. In a battery charging circuit having a transformer, an SCR trigger means coupled to said transformer, a first silicon controled rectifier (SCR1), fed by said transformer and a battery charging side coupleing said first silicon controled rectifier (SCR1) to a battery to charge the battery; a second silicon controled rectifier (SCR2) fed by said battery charging side and a resistor (R5) with a diode (CR4) in series with said battery, said second silicon controled rectifier (SCR2) being connected to said trigger means inhibiting the firing of said trigger circuit after a predetermined charge lever is reached the improvement therein which comprises having first and second battery charging leads, and, in parallel in one of said leads a thermostat (T), a resistor (R') and a capacitor (C) whereby at a predetermined temperature said thermostat will open said lead.

3,911,352

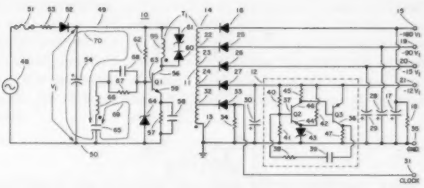
BLOCKING OSCILLATOR TYPE POWER SUPPLY WITH POWER FOLDBACK SHORT CIRCUIT PROTECTION

William Frederick Slack, Andover, N.J., assignor to OPT Industries, Inc., Phillipsburg, N.J.

Filed May 13, 1974, Ser. No. 469,437

Int. Cl.² H02H *7/10, 9/02*

U.S. Cl. 321—14 **18 Claims**



1. A blocking oscillator type power supply with power foldback short circuit protection, comprising:

a transistor having first and second main electrodes and a control electrode;

a transformer having a primary winding, at least one output winding, and a feedback winding;

means for coupling said primary winding in series with said main electrodes and a source of potential difference;

a frequency determining capacitor;

means for coupling said feedback winding in series with said capacitor and in circuit with the control electrode of said transistor to provide positive feedback from said first main electrode to said control electrode by inductive coupling between said primary and feedback windings;

biasing means coupled between said source and said control electrode;

threshold means coupled to said control electrode for limiting the potential applied to said control electrode to a predetermined value and for providing a current flow path for said capacitor through said feedback winding;

means for connecting said output winding to a load; and

means for (i) causing said capacitor to be repetitively charged through said threshold means to enable said oscillator to operate at a given frequency when said load has a given value, and for (ii) causing said capacitor to be repetitively charged through said biasing means to cause said oscillator to operate at a substantially lower frequency when said output winding is short-circuited by said load, thereby substantially decreasing the power delivered to said load and limiting the power dissipated in said oscillator to a safe operating value while said output winding is short-circuited.

3,911,353

CURRENT STABILIZING ARRANGEMENT

Rudy Johan van de Plassche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 22, 1974, Ser. No. 526,136

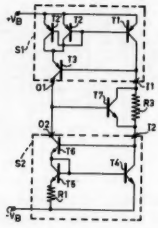
Claims priority, application Netherlands, Dec. 4, 1973, 7316556

Int. Cl.² G05F *1/10, 3/02*

U.S. Cl. 323—1 **6 Claims**

1. A current stabilizing arrangement, which comprises a first and a second current circuit connected between a first and a second supply terminal, said first and second current circuits comprising, a first current dividing circuit with transistors of a first conductivity type, which has an input circuit with a low input impedance and an output circuit with a high output impedance, a second current dividing circuit with transistors of a second conductivity type also having an input circuit with a low input impedance and an output circuit with a high output impedance, the first current dividing circuit defining the ratio of the currents flowing in the two current circuits, and the second current dividing circuit defining the absolute

values of the two currents which flow in the two current circuits by the parallel connection of a first semiconductor junction with the series connection of a second semiconductor junction and a first resistance, the first current circuit including the series connection of the input circuits of the two current dividing circuits and the second current circuit including



the series connection of the output circuits of the two current dividing circuits, a real impedance included in the first current circuit between the input circuits of the two current dividing circuits, a transistor with its main current path connected in shunt with the real impedance, and means coupling the transistor control electrode to the second current circuit.

3,911,354

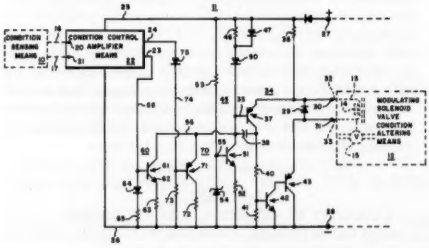
CONDITION RESPONSIVE CURRENT CONTROL UNIT

David J. Stanton, New Brighton, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 10, 1974, Ser. No. 513,904

Int. Cl.² G05F *1/56*

U.S. Cl. 323—4 **10 Claims**



1. A condition responsive control unit, including: condition control amplifier means adapted to be connected to condition sensing means as an input and said control unit having current control output means including a voltage responsive input control; said current control output means adapted to modulate a current in condition altering load means; first load control circuit means having variable voltage output means connected to said voltage responsive input control for said current control output means; said first load control means having a fixed voltage output when said condition control amplifier means has an output below a first level; and second load control circuit means responsive to said condition control amplifier means and connected to said voltage responsive input control to change the voltage at said voltage input control and thereby cause said current control output means to increase said current to said load means.

3,911,355

NMR SPECTROMETER PROBE WITH EDDY CURRENT BRAKE

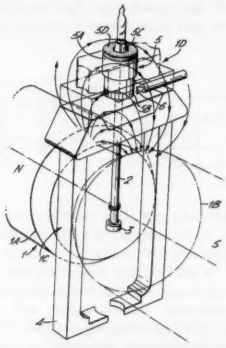
John Bryant Leane, Beaconsfield, and Peter Higham, High Wycombe, both of England, assignors to Perkin-Elmer Limited, Beaconsfield, England

Filed May 16, 1974, Ser. No. 470,684

Claims priority, application United Kingdom, May 21, 1973, 24065/73

Int. Cl.² G01R *33/08*

U.S. Cl. 324—.5 AH **9 Claims**



1. In a gyromagnetic resonance spectrometer provided with means for spinning a longitudinally extending sample holder around its longitudinal axis transversally to the lines of force extending between two opposed magnetic poles defining the working gap of a polarizing magnet, the combination with said sample holder of an eddy-current brake device mounted for rotation with the sample holder in the magnetic field external to the magnetic field volume within which the sample is to be accommodated, said device tending to stabilize sample spinning speed by virtue of the electromagnetic coupling set up between the spinning device and the magnetic field without causing significant magnetic field disturbances at the sample.

3,911,356

ELECTRICAL MEASURING INSTRUMENT HAVING STATIONARY COIL-MOVING IRON MECHANISM WHICH OPERATES ON ATTRACTION PRINCIPLE

Thomas H. Putman, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 20, 1974, Ser. No. 471,732

Int. Cl.² G01R *5/18*

U.S. Cl. 324—147 **28 Claims**

1. An electrical instrument, comprising:

a magnetic circuit and winding assembly having an opening therein,

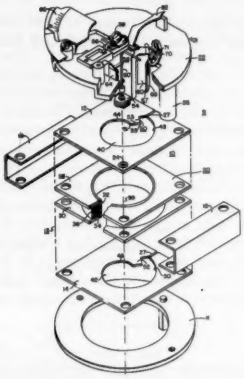
said magnetic circuit and winding assembly including first and second spaced magnetic plate members, each of said first and second magnetic plate members defining an opening, with at least one of the openings having a generally spirally-shaped configuration, and an electrical coil disposed relative to said spaced first and second plate members such that they acquire different magnetic polarities in response to current flow through said electrical coil,

a movable assembly mounted for restrained rotation within the opening of said magnetic circuit and winding assembly,

said movable assembly including a magnetic element which provides a first magnetic circuit between said first and second magnetic plate members,

and indicating means coupled to said movable assembly for indicating the angular position of said movable assembly,

said magnetic element of said movable assembly coacting with the magnetic flux provided by current flow in the electrical coil to provide magnetic polarities on portions of the magnetic element adjacent to said first and second magnetic plate members which are different than those of the adjacent magnetic plate members to provide attrac-



tive forces which exert a torque on the movable assembly, said torque rotating the restrained movable assembly, with the permeance of the first magnetic circuit changing as the movable member rotates in either direction, due to the generally spirally-shaped configuration of at least one of the openings defined by the first and second magnetic plate members.

3,911,357

DEVICE FOR TESTING THE CONTINUITY OF AN ELECTRICAL NETWORK DEPOSITED ON A GLASS SHEET

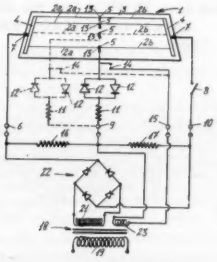
Amos Adam, Lozere, France, assignor to Boussois S.A., Paris, France

Filed Mar. 4, 1974, Ser. No. 448,044

Claims priority, application France, Mar. 13, 1973, 73.08826

Int. Cl.² G01R *31/02*

U.S. Cl. 324—51 **7 Claims**



1. A device for testing the continuity of a two-terminal electrical network deposited on a glass sheet and comprising at least two resistive strips connected in parallel to each other and in series between the terminals of said network and each having at least one accessible test point which divides said strips into two portions having ohmic values which are in a ratio K relative to each other, said device comprising at least one detecting system, wherein said device comprises a frame for holding the glass sheet on which the electrical network is deposited, two end terminals connected to end terminals of two direct current sources in series and one intermediate supply terminal connected to the intermediate terminal between said sources, said sources having electromotive forces in said ratio K relative to each other, detachable connecting means between each end supply terminal and the terminals of the network, a feeler for establishing an electrical contact between the test point of one resistive strip of said network and said detecting system, which is connected on the one hand to said feeler and on the other hand to said intermediate supply terminal, a fourth supply terminal connected to one end of an auxiliary current source whilst the other end of said source is connected to said intermediate supply terminal, and means for connecting said fourth supply terminal to said feeler.

3,911,358

METHOD OF AND DEVICE FOR DETERMINING THE DISTANCE TO A FAULT IN A WIRE OR CABLE LINE

German Mikhailovich Shalyt, ulitsa Udaltsova 55, kv. 55, Moscow; Boris Lvovich Kofman, Prospekt Lenina, 53, kv. 33, Bryansk, and Valery Alexandrovich Polovnikov, Pereulak Fokina 8, kv. 60, Bryansk, all of U.S.S.R.

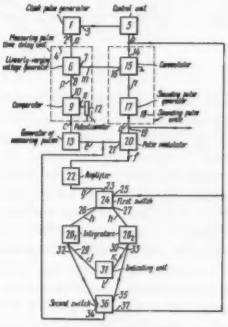
Continuation of Ser. No. 368,066, June 8, 1973, abandoned, which is a continuation-in-part of Ser. Nos. 280,779, Aug. 15, 1972, abandoned, and Ser. No. 283,361, Aug. 24, 1972, abandoned, said Ser. No. 280,779, is a continuation of Ser. No. 74,072, Sept. 21, 1970, abandoned, said Ser. No. 283,361, is a continuation of Ser. No. 36,980, May 13, 1970, abandoned.

This application Mar. 28, 1974, Ser. No. 455,957

Claims priority, application U.S.S.R., May 21, 1969, 1332881

Int. Cl.² G01R *31/08, 31/11*

U.S. Cl. 324—52 **2 Claims**



1. A method of measuring the distance to a fault in a wire or cable line comprising the steps of:

continuously sending sounding voltage pulses through the line at a preset repetition rate throughout a measuring period; periodically monitoring the voltage in the line at a rate twice as high as the repetition rate of said sounding pulses, the monitoring commencing after the sending of said sounding pulses with a time delay whose value corresponds to the distance of a portion of the line being monitored each first monitoring of the voltage of the line coinciding with the period of the presence of a sounding pulse, the signals coming from said line comprising pulses reflected from the fault when the portion of the line being monitored is faulty and noise, and each second monitoring coinciding with the period of the absence of a sounding pulse, the signals coming from said line including only noise; amplifying the signals received from said line during both said monitorings; separately integrating said signals and determining the difference between the integrated values; successively monitoring the voltages across

each portion of said line by measuring the value of said time delay in order to obtain said difference between the integrated values of the signals coming from the line, the value of said difference of the integrated values exceeding greatly a voltage level of the other portions of the lines; and registering the values of said time delay that corresponds to said value of the difference between the integrated values which is considerably greater than the other values of the difference between said voltages so as to integrate the faulty portion whose distance is correlated accurately to the registered value of said time delay.

3,911,359
TRUE RMS CONVERTERS

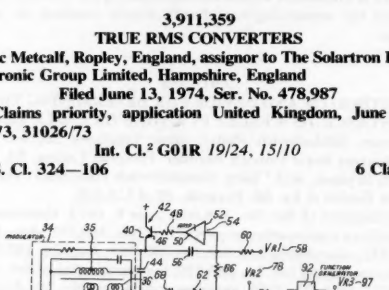
Eric Metcalf, Ropley, England, assignor to The Solartron Electronic Group Limited, Hampshire, England

Filed June 13, 1974, Ser. No. 478,987

Claims priority, application United Kingdom, June 29, 1973, 31026/73

Int. Cl.² G01R *19/24, 15/10*

U.S. Cl. 324—106 **6 Claims**



1. A device for use in measuring the root mean square value of an input signal, comprising first and second substantially identical heating elements, means for applying to the first heating element a signal representative of the input signal, means for sensing a temperature differential between the first and second heating elements and for providing a signal representative thereof, a feedback circuit connected to receive the signal representative of temperature differential and to apply a feedback signal to the second heating element so as to reduce the said temperature differential, a source of reference signal, and an adjustable A.C. power source responsive to the reference signal and a signal from the feedback circuit to deliver to each of the first and second heating elements an amount of power dependent of the difference between the reference signal and said signal from the feedback circuit, said power source being arranged to deliver substantially the same amount of power to each of the said heating elements, whereby the total power received by each heating element remains substantially constant and the feedback signal is representative of the RMS value of the input signal.

3,911,360
VARIABLE TIME DELAY VOLTAGE DROPOUT DETECTOR

Gene A. Kimzey, 2329 Tulip Road, San Jose, Calif. 95128

Filed Feb. 11, 1974, Ser. No. 441,576

Int. Cl.² G01R *19/16*

U.S. Cl. 324—133 **2 Claims**

1. A circuit for monitoring the voltage level of a voltage source, comprising:

a. a first comparator circuit,

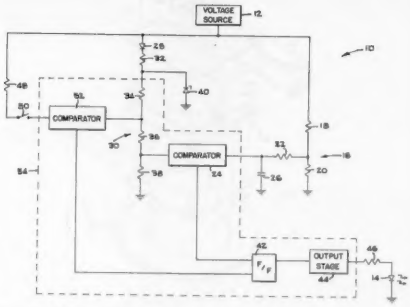
b. a first voltage divider circuit connected between the voltage source and a first input of said first comparator circuit,

c. circuit means forming a source of reference voltage for supplying a reference voltage to a second input of said first comparator circuit,

d. an indicator connected to an output of said first comparator circuit,

e. a time-delay circuit connected between said voltage divider circuit and the first input of said first comparator circuit,

f. means for storing the output of said first comparator circuit and connected between said first comparator



circuit and said indicator, said storing means including a flipflop circuit having a first input connected to the output of said first comparator circuit and an output connected to said indicator,

g. a second comparator circuit, and

h. a switch connected between the voltage source and a first input of said second comparator circuit,

said circuit means being connected to a second input of said second comparator circuit for supplying the reference voltage thereto and an output of said second comparator circuit being connected to a second input of said flip-flop.

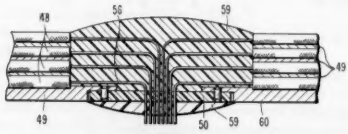
3,911,361
COAXIAL ARRAY SPACE TRANSFORMER

Ronald Bove, Wappingers Falls; Alexander Kostenko, Jr., Hopewell Junction, and William J. Tkazyik, Jr., Hyde Park, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1974, Ser. No. 484,052

Int. Cl.² G01R *31/02, 1/06*

U.S. Cl. 324—158 P **3 Claims**



1. In an electronic test system including a tester for electrically testing devices fabricated by large scale integration techniques,

an electrical structure for connecting said tester to an electronic device under test, said structure consisting essentially of an electrical array space transformer and a probe contactor having a plurality of buckling beam probes, and

wherein said electrical array space transformer comprises:

a first spaciously spaced array of electrical contacts lying within a first planar surface in space;

a second densely spaced array of electrical contacts lying within a second planar surface in space, wherein said first

and second planar surfaces are displaced parallel one from the other;

a plurality of coaxial electrical conductor, disposed between said first spaciously spaced array of electrical contacts and said second densely spaced array of electrical contacts, each of said plurality of electrical conductors electrically interconnecting a discrete one of said first spaciously spaced array of electrical contacts with a discrete one of said second densely spaced electrical contacts;

structural means supporting said first spaciously spaced electrical contacts, said second densely spaced electrical contacts and said plurality of conductors;

said structural means consisting essentially of:

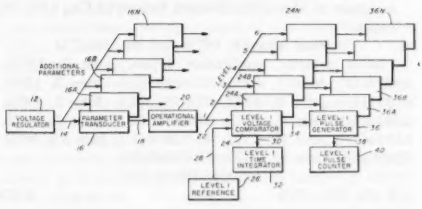
a plurality of portions of material, certain of said portions of material having high electrical conductivity and other portions of said material being essentially non-electrically conductive and having predetermined dielectric properties,

whereby each of said plurality of electrical conductors provides an electrical path from a discrete one of said first spaciously spaced electrical contacts to a discrete one of said second densely spaced electrical contacts and each of said plurality of electrical conductors has substantially uniform electrical impedance characteristics, and cross-talk between said electrical conductors is minimized.

3,911,362
STATISTICAL ANALOG MONITOR

Gary A. Roberts, and Ernest C. Fitch, Jr., both of Stillwater, Okla., assignors to Board of Regents for the Oklahoma Agricultural and Mechanical Colleges Acting on Behalf of Oklahoma State University of Agriculture and Applied Science, Stillwater, Okla.

Continuation-in-part of Ser. No. 302,104, Oct. 30, 1972, abandoned. This application May 17, 1974, Ser. No. 471,128
Int. Cl.² G04F *8/00*
U.S. Cl. 324—182 **11 Claims**



1. In a statistical analog monitor for use in providing data related to the average duty cycle of a selected variable parameter of an operation, comprising:

a. first means to measure the instantaneous value E_s of said parameter in terms of a selected variable V;

b. second means to compare the instantaneous value E_s of said variable with at least one reference value E_r of said variable;

c. third means responsive to said second means to compare, to indicate the integrated time T_s that E_s is selectively different from E_r, during a total elapsed time T_t; and

d. fourth means responsive to said second means to compare, to indicate the total number of separate times N during the total elapsed time T_t that E_s is different from E_r;

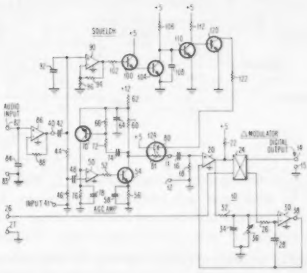
the improvement comprising;

feedback means in conjunction with said second means to compare, whereby said second means exhibits hysteresis, in that it produces an output signal when the instantaneous value of said variable E_s is equal to or greater than E_r and stops producing said output signal when said variable E_s is equal to or less than a value $E_r - \Delta E$, where ΔE is of a selected magnitude.

3,911,363
DELTA MODULATION CIRCUITRY WITH AUTOMATIC SQUELCH AND GAIN CONTROL

Michael Allen Patten, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1974, Ser. No. 530,903
Int. Cl.² H04B *1/00*
U.S. Cl. 325—38 B **12 Claims**



1. Delta modulation circuitry with automatic gain and/or squelch control for use in a pulse amplitude modulation voice and data communications alternating current signal switching control, comprising:

a voice and/or data signal input circuit, and

a delta modulating circuit of the type having a latch, a comparator and at least one integrator circuit,

characterized in that

a self balancing network is connected in the integrator circuit for balancing the modulator while eliminating periodic adjustment, and

further characterized in that

said input circuit is coupled to said modulating circuits by an electronic coupling circuit having a coupling element and an electroptical control element,

an automatic gain controlling amplifying circuit is interposed between said input circuit and said coupling circuit having a differential amplifier and an a.g.c. level sensing circuit interconnected to reduce gain variation, and

a squelch control circuit connected between said input circuit and the control element of said coupling circuit for opening the latter in the absence of said voice and/or data signal.

3,911,364
COPHASING COMBINER WITH COCHANNEL SIGNAL SELECTOR

Rollin Edward Langseth, Colts Neck, and Yu Shuan Yeh, Freehold Township, Monmouth County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 9, 1974, Ser. No. 468,416
Int. Cl. H04b *7/08*
U.S. Cl. 325—301 **12 Claims**

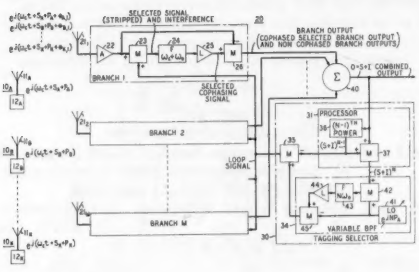
1. A transmission system comprising, a plurality of spaced transmitting sources, each source transmitting a signal at a common carrier frequency but having PSK information modulation and pilot tag modulation uniquely associated with that source, and a diversity receiver having a plurality of branches, the receiver including

means in each of the branches for receiving a branch input consisting of all of the signals transmitted from the plurality of sources,

means for combining the outputs of each branch to produce a combined output,

means for operating on the combined output to select the one unique pilot tag modulation associated with a se-

lected source and produce a loop signal uniquely identified by the selected one unique pilot tag modulation, means in each of the branches for combining the loop signal with the branch input to produce the branch output, a portion of said branch output being derived from the one



signal of the branch input having the one selected unique pilot tag modulation exclusive of all other signals of the branch input, said portion being cophased with the corresponding portion of each other branch output derived exclusively from the selected source.

3,911,365
NARROWBAND RECEIVING SYSTEM WITH IMPROVED SIGNAL TO NOISE RATIO

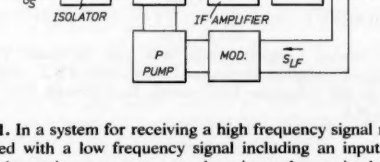
Robert Maurer, Laatzen near Hannover, and Karl-Heinz Locherer, Langenhagen, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Oct. 26, 1972, Ser. No. 301,242

Claims priority, application Germany, Oct. 26, 1971, 2153244

Int. Cl. H03c *3/06*

U.S. Cl. 325—346 **12 Claims**



1. In a system for receiving a high frequency signal modulated with a low frequency signal including an input stage having an input converter to whose input the received modulated high frequency signal is applied and a converter oscillator associated with said input converter, and a demodulator connected to the output of said converter for demodulating the received signal, said system having an input band width which is so narrow that the received signals can only just be received without distortion, the improvement comprising means for feeding back a portion of the low frequency output signal of said demodulator to said converter oscillator which is sufficient to reduce the noise factor of the system to below the value one, said feedback means including means for modulating said converter oscillator with said low frequency signal, the type of modulation being the same as that of the input signal to the receiver.

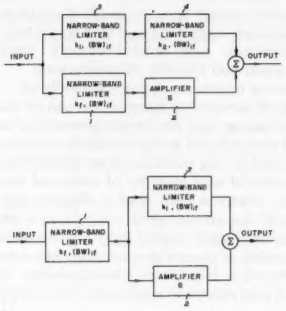
3,911,366
RECEIVER INTERFERENCE SUPPRESSION TECHNIQUES AND APPARATUS

Elie J. Baghdady, 21 Overlook Drive, Weston, Mass. 02193

Filed Nov. 13, 1958, Ser. No. 773,785

Int. Cl.² H04B *1/16*

U.S. Cl. 325—347 **11 Claims**



1. A frequency modulation receiver for separating a stronger and a weaker signal comprising two channels, first limiting means in a first channel, second limiting means in said first channel, limiting means in the second channel, linear transfer means in said second channel, and means for combining the outputs of the two channels.

3,911,367
REMOTE CONTROLLED RECEIVING APPARATUS WHICH PREVENTS ERRONEOUS OPERATION DUE TO NOISE

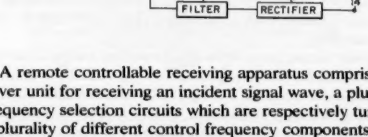
Hiroshi Saito, and Kunito Miyamoto, both of Katano, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 31, 1973, Ser. No. 365,731

Claims priority, application Japan, June 2, 1972, 47-55278[U]; June 2, 1972, 47-65511[U]; June 2, 1972, 47-65512[U]; June 2, 1972, 47-65513[U]; June 2, 1972, 47-65514[U]; June 2, 1972, 47-65515[U]; June 2, 1972, 47-65516[U]; June 19, 1972, 47-72896[U]; June 19, 1972, 47-72897[U]; June 19, 1972, 47-72898[U]

Int. Cl.² H04B *1/10*

U.S. Cl. 325—392 **5 Claims**



1. A remote controllable receiving apparatus comprising a receiver unit for receiving an incident signal wave, a plurality of frequency selection circuits which are respectively tunable to a plurality of different control frequency components contained in the received signal wave for control of the apparatus, a plurality of detector circuits for detecting first output signals supplied from said frequency selection circuits respectively, said detector circuits having respective output terminals for providing second output signals corresponding to said first output signals, a plurality of switching circuits, each including a first transistor, for turning on in response to said second output signals of said detector circuits above definite levels thereof respectively, a plurality of controllable devices which are on-off controlled by the respective switching circuits, an

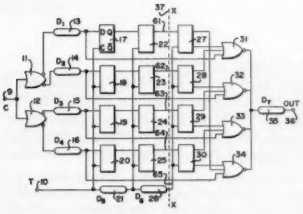
inhibit circuit for detecting AC noise components included in the second output signals of said detector circuits to turn off said switching circuits, and first capacitor means, connected between ground and the base of said first transistor and between ground and said output terminals of said detector circuits, for retarding the turn-on of said switching circuits to avoid the turn-on of said switching circuits due to the AC noise components and to allow the turn-on of said switching circuits due only to the control frequency components, said first capacitor means being connected to said inhibit circuit to discharge through said inhibit circuit when the AC noise components are detected.

3,911,368

PHASE INTERPOLATING APPARATUS AND METHOD

Zoltan Tarczy-Hornoch, 7106 Marlborough Terrace, Berkely, Calif. 94705

Filed June 20, 1974, Ser. No. 481,066
Int. Cl.² H03K *5/159*
U.S. Cl. 328—155 **9 Claims**



1. In an interpolation apparatus
at least first N and second N bistable circuit means, where N is an integer greater than one,
means connecting one input each of said first N bistable circuit means to a first input terminal to receive a first signal therefrom,
another input of said first N bistable circuit means connected each to an output terminal of N delay elements of differing length, wherein one delay element may represent zero delay,
means connecting the input terminals of said N delay elements to a second input terminal to receive a second signal therefrom,
means connecting one output terminal each of said first N bistable circuit means to one input terminal each of said second bistable circuit means,
and means connecting another input each of said second N bistable circuit means to receive a replica of said first signal, said second N bistable circuit means thereby serving to trigger with lessened probability marginally if any of said first N bistable circuit means is marginally triggered.

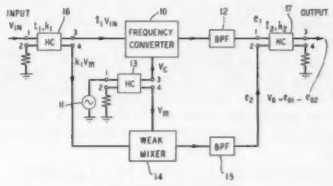
3,911,369

POSTDISTORTION COMPENSATION OF FREQUENCY CONVERTERS

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 3, 1974, Ser. No. 502,727
Int. Cl.² H04B *1/04*
U.S. Cl. 328—163 **4 Claims**

1. In combination:
a first frequency converter having a nonlinear frequency conversion characteristic resulting in the generation of intermodulation distortion signal components;
a second frequency converter having a nonlinear frequency conversion characteristic;
means for coupling the input ends of said converters to a common input circuit;
means for coupling the output ends of said converters to a common output circuit;
and a common local oscillator coupled to both of said converters;
Characterized in that:



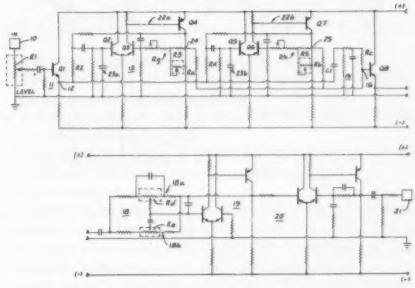
the magnitude of the local oscillator signal coupled to said second converter is less than the magnitude of the local oscillator signal coupled to said first converter;
and in that the output signals from said frequency converters are combined in said common output circuit out of phase such that the magnitude of the resulting intermodulation distortion signal components appearing in said common output circuit is less than that produced by said first frequency converter operating alone.

3,911,370

AUDIO FREQUENCY AMPLITUDE COMPENSATOR

Jerry B. Pace, 2206 John St., Pasadena, Tex. 77502

Filed July 22, 1970, Ser. No. 57,293
Int. Cl.² H03F *3/04*
U.S. Cl. 330—21 **8 Claims**



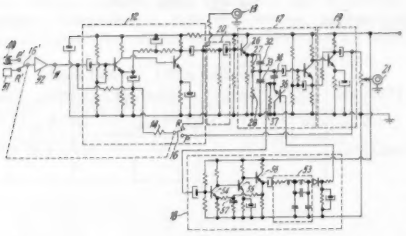
1. An audio frequency amplitude compensator responding to audio frequency signals including such signals in the mid-range audio frequency range and in the bass and treble audio frequency ranges to provide an increase in the amplitude of said bass and treble range signals in relation to the amplitude of mid-range audio frequency signals, comprising in combination: an input for receipt of said audio frequency signals; an output; a first bass audio frequency boost circuit including a variable Q band pass filter having a relatively narrow band pass frequency response in the bass audio frequency range, and connected to said input and providing for a first increase in the amplitude of said bass audio frequency signals, a first treble audio frequency boost circuit including a variable Q band pass filter having a relatively narrow band pass frequency response in the treble audio frequency range and connected to said input to provide a first increase in the amplitude of said treble audio frequency signals; a second bass audio frequency boost circuit connected between said first bass audio frequency boost circuit and said output and providing for a second increase in the amplitude of said bass audio

frequency signals, said second bass audio frequency boost circuit having a relatively broad band pass frequency response and including within its band widths the band width of said first bass audio frequency boost circuit; and a second treble audio frequency boost circuit connected between said first treble audio frequency boost circuit and said output and providing for a second increase in the amplitude of said treble audio frequency signals, said second treble audio frequency boost circuit having a relatively broad band treble frequency response and including within its band width the band width of said first treble audio frequency boost circuit, the composite band pass of said first and second bass and treble boost circuits being such that said audio frequency signals in the bass and treble audio frequency ranges can be boosted substantially in amplitude while audio frequency signals in the mid-range audio frequencies are not appreciably boosted in amplitude.

3,911,371
SIGNAL TRANSMISSION SYSTEM

Shoichi Nakamura; Noriaki Naito; Tetsuya Horichi, and Yoshitaka Kanamoto, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 274,667, July 24, 1972. This application Aug. 8, 1974, Ser. No. 495,911
Claims priority, application Japan, July 24, 1971, 46-55529
Int. Cl.² H03F *1/34*
U.S. Cl. 330—28 **25 Claims**



21. A signal processing system comprising:

A. a system input circuit to which input signals to be processed are applied;

B. a system output circuit to have connected thereto a utilization device to be energized by processed signals;

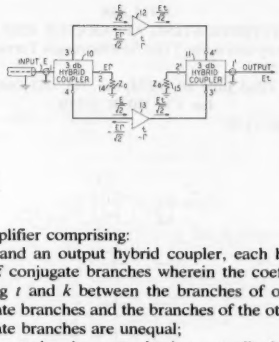
C. means to produce processed signals from said input signals, said means comprising the only signal path linking said input circuit to said output circuit and comprising a filter having a frequency response that has a first substantially flat level in a first frequency range above a first frequency and a second substantially flat level in a second frequency range below a second frequency, said second frequency being lower than said first frequency and said second level being different from said first level, the frequency response between said first and second frequencies being between said first and second substantially flat levels, said filter comprising a variable impedance; and

D. means to vary said impedance in response to the amplitude of at least a portion of said input signals to shift said first and second frequencies simultaneously while maintaining said levels substantially constant.

3,911,372
AMPLIFIER WITH INPUT AND OUTPUT IMPEDANCE MATCH

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 113,201, Feb. 8, 1971, abandoned. This application Dec. 6, 1971, Ser. No. 204,804
Int. Cl.² H03F *3/60*
U.S. Cl. 330—53 **12 Claims**



1. An amplifier comprising:

an input and an output hybrid coupler, each having two pairs of conjugate branches wherein the coefficients of coupling t and k between the branches of one pair of conjugate branches and the branches of the other pair of conjugate branches are unequal;

first and second active stages having mutually dual characteristics, each of which couples one branch of one pair of conjugate branches of the input coupler to a branch of one pair of conjugate branches of the output coupler;

a third branch of said input coupler being the input port of said amplifier;

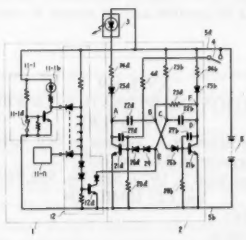
a third branch of said output coupler being the output port of said amplifier;

and means for match-terminating the fourth branches of said input and output couplers.

3,911,373
OSCILLATION CONTROL CIRCUIT FOR VEHICLE WARNING SYSTEM

Toshikazu Ohtake, Okazaki; Koichi Taniguchi, Kariya, and Tadashi Tsuda, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed July 8, 1974, Ser. No. 486,584
Claims priority, application Japan, Aug. 22, 1973, 48-94094
Int. Cl.² G08B *5/38;* **H03K** *3/282*
U.S. Cl. 331—65 **6 Claims**



1. An oscillation control circuit comprising:

a power source having a positive and negative terminal;

a positive and negative power supply line respectively connected with said positive and negative terminal and

an astable multivibrator connected to said positive and negative power supply line, wherein said astable multivibrator comprises:

first and second transistors each having base, emitter and collector electrodes;

means connecting the collector-emitter path of said first transistor across said positive and negative power supply line through a first collector resistor;

means connecting the collector-emitter path of said second transistor across said positive and negative power supply line through a second collector resistor;

a first capacitor connected between the base of said first transistor and the collector of said second transistor;

a second capacitor connected between the base of said second transistor and the collector of said first transistor;

a first base circuit including a first time constant resistor and connected between the base of said first transistor and one of said power supply line;

a second base circuit including a second time constant resistor and connected between the base of said second transistor and the collector of said second transistor, whereby stopping of the oscillating operation of said multivibrator causes said second transistor to become non-conductive.

3,911,374

TRANSDUCER CONTROLLED OSCILLATOR SYSTEM

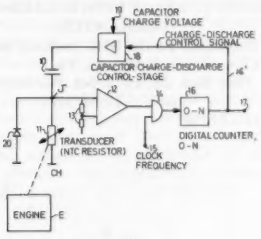
Wolfgang Busse, Schwieberdingen; Hans-Christoph Du Mont, Renningen; Winfried Klötzner, Munchingen; Erwin Gloss, Korntal, and Rolf Däumer, Merklingen, all of Germany, assignors to Robert Bosch G.m.b.H., Gerlingen Schillerhöhe, Germany

Filed Sept. 9, 1974, Ser. No. 504,053

Claims priority, application Germany, Oct. 2, 1973, 2349442

Int. Cl.[2] G01K *7/24;* **H03K** *1/16, 3/02*

U.S. Cl. 331—65 **11 Claims**



1. Transducer controlled oscillator system having an output which changes between discrete values at a repetition rate depending on change in resistance of the transducer (**11**) in response to changes of a condition

characterized by

a capacitor (**10**);

a capacitor charge-discharge control stage (**18**) connected to one terminal of the capacitor, the transducer (**11**) being connected with one terminal to the other terminal of the capacitor;

a threshold sensing circuit (**12, 13**) connected to sense the charge state of the capacitor and providing an output sensing signal of two discrete values (**0, 1**) in dependence on the relation of said charge state with reference to a predetermined threshold;

means (**14, 16**) including a clock pulse supply (**15**) timing the duration during which the output from the threshold sensing circuit (**12, 13**) is at one of the respective discrete values (**0, 1**) to form an output of the oscillator system and changing between said values; and

means (**16'**) connecting a signal representative of said output and derived therefrom to the charge-discharge control stage (**18**) to control said stage to provide charging current to the capacitor when the output signal has one discrete value (**1**) and to discharge the capacitor when the output signal has the other discrete value (**0**) so that, depending on the relative value of the resistance of the transducer (**11**), the threshold level of the threshold sensing circuit (**12, 13**) will be reached at different instants of time during the charging-discharging cycles of the capacitor and the output signal from the oscillator will change between the discrete values with different change-over rates, thereby providing a signal, the frequency of which varies as said condition, and hence the resistance of the transducer varies.

3,911,375

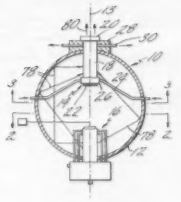
OPTICALLY PUMPED LASER SYSTEMS

Anthony J. DeMaria, West Hartford, and Michael E. Mack, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 278,134, Aug. 4, 1972, abandoned. This application June 21, 1973, Ser. No. 372,370

Int. Cl.[2] H01S *3/091*

U.S. Cl. 331—94.5 P **7 Claims**



1. A pulse laser system comprising:

an optical pumping cavity formed of a surface of revolution and having an axis of symmetry;

an optical resonator positioned inside the cavity along the axis and including:

a pair of mirrors, one of which is fully reflecting and the other of which is partially transmitting; and

a gain medium;

an arc lamp which extends into the optical cavity and has a central axis which is coincident with the cavity axis to produce electromagnetic energy for pumping the gain medium in the resonator, the lamp comprising;

a first primary electrode which is on the central axis and includes,

an enclosure of electrically conductive material which is penetrated by a gas inlet hole encircling the central axis,

a trigger electrode supported along the central aixs, internal to the enclosure, and electrically insulated from the enclosure,

a spacer element of electrically conductive material which forms an extension to the enclosure and is penetrated by a plurality of gas outlet passages, and a trigger electrode energy source for establishing an electrical potential between the trigger electrode and the enclosure;

a second primary electrode which is spaced apart from the first electrode by more than two centimeters along the central axis;

a mounting formed into a gas inlet plenum which is fixedly attached to the second electrode;

an envelope extending between the first and second electrodes, the envelope being transparent to radiation from the lamp and symmetrically disposed about the

central axis to contain a gas flow between the electrodes;

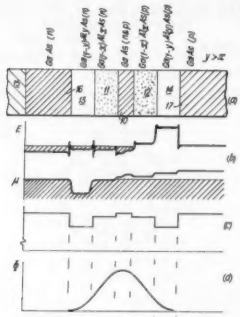
means for introducing gas from the plenum through the mounting and into the envelope at several positions adjacent to the second primary electrode, and

means electrically connected to the first and second electrodes for establishing a voltage difference between the first and second electrodes.

3,911,376
GALLIUM ARSENIDE INJECTION LASERS

George Horace B. Thompson, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 4, 1971, Ser. No. 186,127
Claims priority, application United Kingdom, Oct. 15, 1970, 49051/70
Int. Cl.² H01S 3/00
U.S. Cl. 331—94.5 H **12 Claims**



7. For use in a semiconductor injection laser, a semiconductor body including

first and second heteroboundaries defining a first active region therebetween for confining recombination radiation,

third and fourth heteroboundaries disposed between said first and second heteroboundaries, thereby defining a second active region for confining carriers, the bandgap of said second active region being smaller than that of said first active region, and

a p-n junction located between said first and fourth heteroboundaries.

3,911,377
RELAXATION OSCILLATOR HAVING STABLE PULSE WIDTH

Paul Goodheart, Piscataway, and Abel Ching Nam Sheng, Morris Plains, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,671
Int. Cl.² H03K 1/18, 3/26
U.S. Cl. 331—111 **10 Claims**

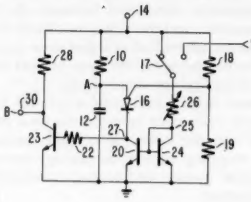
1. An oscillator circuit comprising in combination:

a circuit output, a circuit common and a circuit power terminal;

a charging circuit comprising charge storage means coupled between said circuit common and said circuit power terminals;

means for providing a reference voltage;

a programmable unijunction transistor having relatively high and relatively low impedance states, said programmable unijunction transistor having first and second main terminals and a control terminal, said control terminal coupled to said means for providing a reference voltage and said first main terminal coupled to said charge storage means, said programmable unijunction transistor assuming its low impedance state whenever the potential across said charge storage means exceeds said reference voltage by a predetermined amount, thereby providing a discharge path for said charge storage means;



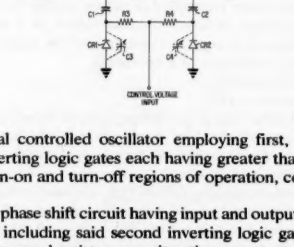
means coupled to said second main terminal for discharging said charge storage means at an essentially constant rate; and

means responsive to the discharge of said charge storage means for producing an output voltage at said circuit output terminal at a relatively low first level whenever said programmable unijunction transistor assumes its low impedance state and responsive to the voltage across said charge storage means for producing a voltage at said circuit output terminal at a relatively high second level when said voltage drops to lower than a given value.

3,911,378
TTL GATE VOLTAGE CONTROLLED CRYSTAL OSCILLATOR

James E. Buchanan, Bowie, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 25, 1974, Ser. No. 509,170
Int. Cl.² H03B 5/36
U.S. Cl. 331—116 R **11 Claims**



1. A crystal controlled oscillator employing first, second and third inverting logic gates each having greater than unity gain in its turn-on and turn-off regions of operation, comprising:

a first 360° phase shift circuit having input and output terminals and including said second inverting logic gate, and first and second resistor-capacitor time constant circuits connected respectively between the input terminal of said phase shift circuit and the input of said second logic gate, and between the output of said second logic gate and the output terminal of said phase shift circuit, the resistor-capacitor values of said time constant circuits being selected with respect to the turn-on characteristics of oper-

ation of said second logic gate to afford the said 360° phase shift,

a crystal connected between said input and output terminals of said first 360° phase shift circuit,

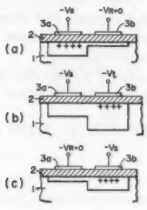
a second 360° phase shift circuit including said first and third inverting logic gates connected in series between the input and output terminals of said first 360° phase shift circuit, and

means for deriving an oscillation output from said second 360° phase shift circuit.

3,911,379
REVERBERATION DEVICE

Kiminori Yamaguchi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed July 31, 1973, Ser. No. 384,289
Claims priority, application Japan, Aug. 11, 1972, 47-80554
Int. Cl.² H03H *7/20, 7/22, 7/36*
U.S. Cl. 333—29 **4 Claims**

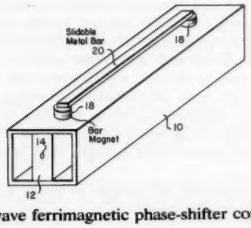


1. A reverberation device comprising an input terminal, an output terminal, a plurality of signal delay lines each having delaying elements whose delaying time is variable in series therein, output and input ends of said lines being respectively connected in common respectively to said input terminal and said output terminal, each of said plurality of signal delay lines comprising a semiconductor substrate having an insulating layer formed thereon and having a plurality of electrodes formed on the insulating layer to form a plurality of charge coupled device elements which function as said delaying elements, the numbers of said delaying elements in the respective lines being different from each other, clocking means for applying clocking signals to the electrodes of said charge coupled device elements, and output level varying elements connected at the outputs of said respective lines.

3,911,380
INSERTION PHASE TRIM METHOD

Louis J. Lavedan, Jr., Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 4, 1974, Ser. No. 476,168
Int. Cl.² H01P *1/18, 1/40*
U.S. Cl. 333—31 A **8 Claims**



1. A microwave ferrimagnetic phase-shifter comprising:

waveguide means;

ferrimagnetic toroid means contained and extending longitudinally within said waveguide means;

first magnet means attached to the outside surface of one of the longitudinally extending walls of said waveguide means;

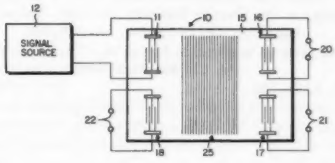
second magnet means attached to the outside surface of the same waveguide wall upon which said first magnet means is attached, and placed such that a line connecting said first magnetic means to said second magnetic means would be parallel to the longitudinal axis of said waveguide means;

longitudinally extending electrical conductor means providing a surface area at each longitudinal end, placed so that each end surface area contacts the top surface areas of said first and second magnetic means respectively such that said conductor means may be slid back and forth to vary the surface area contact between the conductor end surfaces and the top surfaces of the two magnetic means and thus vary the flux linkages through the path comprising the two magnet means, said conductor means, and said toroid means, thus varying the permeability of the toroid means and thus the phase shift of the phase-shifter.

3,911,381
TUNABLE ACOUSTIC WAVE PROPAGATION DEVICE

Robert E. Brooks, Manhattan Beach, and Reynold S. Kagiwada, Los Angeles, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Sept. 6, 1974, Ser. No. 503,900
Int. Cl.² H04R *17/10;* **H03H** *9/26, 9/32*
U.S. Cl. 333—72 **8 Claims**



1. In a tunable acoustic wave propagation device:

a. a layer of piezoelectric material;

b. a layer of photoconductive material disposed on said piezoelectric layer;

c. a substantially monochromatic light source for generating a first light beam;

d. means for splitting said first light beam into a second and third light beam and for projecting them at a predetermined angle onto said photoconductive layer to generate thereon a series of spaced stripes to render said photoconductive layer conducting where a stripe is projected; and

e. means for varying the angle between said second and third light beams, thereby to vary the spacing of said stripes.

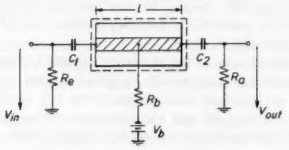
3,911,382
TUNEABLE DELAY LINE

Wolfgang Harth, and Jorg Muller, both of Braunschweig, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed July 6, 1973, Ser. No. 377,019
Claims priority, application Germany, July 7, 1972, 2233468; July 7, 1972, 7225439
Int. Cl.² H01P *9/00*
U.S. Cl. 333—84 M **13 Claims**

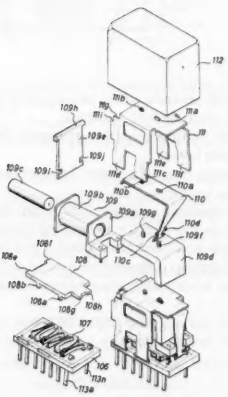
1. A variable delay line consisting of in combination:

a semiconductor body;
a layer of insulating material on one surface of said semiconductor body;
a stripwise metal conductor on the surface of said insulating layer, said conductor having a width which is smaller than the width of said insulating layer and of said semiconductor body;



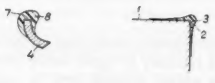
an electrical contact applied to the surface of said semiconductor body opposite to said one surface; and
means for applying a variable direct voltage to said conductor, whereby the delay time of the electrical wave on said conductor resulting from the application of an electrical signal to one end thereof is determined by the value of the applied direct voltage.

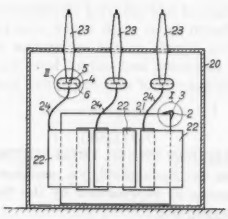
3,911,383
ELECTROMAGNETIC RELAY
Hitoshi Tabei, and Munetada Kazama, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1974, Ser. No. 446,601
Claims priority, application Japan, May 14, 1973, 48-55553
Int. Cl.[2] H01H *67/00*
U.S. Cl. 335—106 **9 Claims**



1. A miniature electromagnetic relay including a header comprising an insulating base plate and a plurality of L-shaped terminals, said terminals being arranged in two rows with the first arms of said respective terminals being positioned on one side of said insulating base plate and the second arms of said respective terminals being projected out from the other side of said insulating base plate; a contact assembly comprising stationary contact pieces secured vertically to the first arms of one group of terminals and movable contact springs secured at one end to the first arms of the other group of said terminals, each of said movable contact springs being arranged in contactable relationship at its other end with a corresponding one of said stationary contact pieces; a card structure movable in a direction parallel to the surface of said header and having protuberances provided adjacent corresponding stationary contact pieces; an electromagnetic assembly adapted to attract said card structure to thereby effect a touching and separation operation between said stationary contact pieces and said movable contact springs; and a return spring adapted to restore the original position of the card structure after it has been moved by the said electromagnetic assembly.

3,911,384
INCREASING THE DIELECTRIC STRENGTH IN METAL ELECTRODES
Olle Andersson; Ellerth Ericsson, and Svante Forsberg, all of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed June 19, 1974, Ser. No. 480,929
Claims priority, application Sweden, June 20, 1973, 7308658
Int. Cl.[2] H01F *27/34*; **H01B** *17/44*
U.S. Cl. 336—84 **3 Claims**





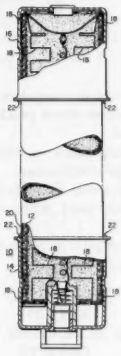
1. In an electrical apparatus, first and second members formed of conductive material with an insulating liquid therebetween, one of said members being a live member, one of the members having a surface exposed to the insulating liquid, said surface having portions which are exposed to a considerably greater field strength than other portions of the surface when a high voltage exists in such live element, and a layer on such surface of a resin with a dielectric constant which is high in comparison with the dielectric constant of the insulating liquid, said layer being substantially thicker at such portions exposed to the greater field strength than at such other portions.

3. An arrangement as claimed in claim **1**, in which said apparatus is a transformer.

3,911,385
OUTDOOR CURRENT LIMITING FUSE

Donald D. Blewitt, Pittsburgh; Frank L. Cameron, North Huntingdon, and Charles H. Vondracek, Murrysville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 7, 1974, Ser. No. 467,699
Int. Cl.[2] H01H *85/02*
U.S. Cl. 337—202 **3 Claims**

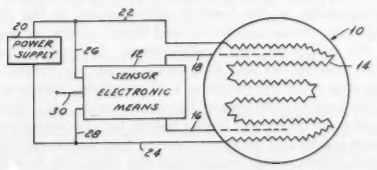


1. A fuse structure comprising a generally tubular, electrically insulating casing, terminal means disposed adjacent to each of the opposite ends of said casing, a fusible element disposed within the casing and connected between said terminal means, a coating of an cycloaliphatic epoxy resin on the exterior surface of the casing and having a thickness of from about 3 to 20 mils, and the coating comprising a polyazelaic polyanhydride having an approximate molecular weight of 2100–2500 and hexa-hydrophtholic anhydride which in combination is contained in the coating at a ratio of 30–115 parts by weight per 100 parts of resin, a filler selected from a-group consisting of aluminum trihydrate and magnesite, and a thixotroping agent.

3,911,386
EXHAUST GAS AIR FUEL RATIO SENSOR

Gordon L. Beaudoin, Dearborn; Lawrence R. Foote, Birmingham; Jerome F. Hough, Allen Park, and Stanley R. Merchant, Garden City, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 15, 1975, Ser. No. 541,365
Int. Cl.[2] H01C *13/00*
U.S. Cl. 338—34 **4 Claims**



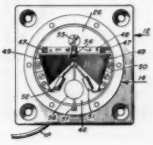
1. In combination with a resistive type exhaust gas sensor of the type having a pair of resistance sensing leads embedded within a titania ceramic wafer having a pair of surfaces, the improvement comprising:

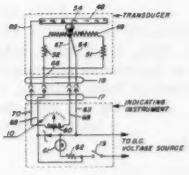
a pair of heater wafers disposed in contact with, and forming ceramic bonds with, the surfaces of the titania wafer; each of said heater wafers comprising electrical resistance heater means embedded within an alumina ceramic wafer.

3,911,387
LOAD MEASURING APPARATUS

Richard W. Seabury, Jr., Towaco, N.J., assignor to R F L Industries, Inc., Boonton, N.J.

Division of Ser. No. 389,232, Aug. 17, 1973, Pat. No. 3,850,035. This application Sept. 23, 1974, Ser. No. 508,212
Int. Cl.[2] H01C *9/06*
U.S. Cl. 338—47 **2 Claims**





1. A variable resistor comprising,

a. contact bar,

b. a wire winding having turns including portions which are substantially equally spaced from the contact bar,

c. a rod mounted for displacement relative to said winding, and

d. a metal ball making a bridging electrical contact between the contact bar and the said portions of the wire turns, said ball being rotatable about and slidable along the said rod.

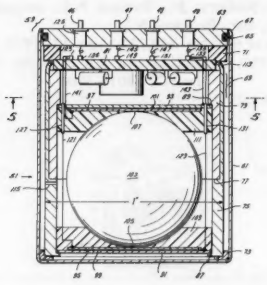
3,911,388
ACCELEROMETER

Eldon Eugene Crump, Richmond, and James Harold Brown, Houston, both of Tex., assignors to Houston Products and Services, Inc., Houston, Tex.

Filed Sept. 21, 1973, Ser. No. 399,605
Int. Cl. G01v *1/16*
U.S. Cl. 340—17 **10 Claims**

1. An accelerometer comprising support first means, planar piezoelectric first crystal means carried by said support means, a mass having a surface at least a portion of which is spherically curved and which curved surface portion is in contact with said crystal means, and elastomeric material disposed in the annular space between said surface portion and said crystal means around the place of contact between said surface portion and said crystal means and in engagement with said surface portion and said crystal means, said crystal means comprising layers of crystal and spring material with a layer of adhesive therebetween, said elastomeric material providing more damping than would exist absent such material said elastomeric material further serving to couple the acceleration forces developed between said support means and said mass in a non-linear fashion tending to neutralize the effect of the non-linear voltage - bending function of the

crystal layer of the crystal means and of the non-linear bending of the crystal means due to its multiple layers and materials

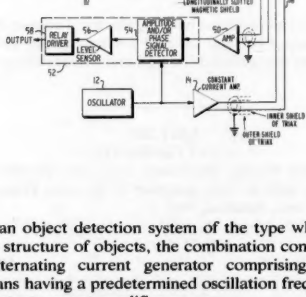


to yield lower distortion voltage output than would be had if said elastomeric material were omitted.

3,911,389
MAGNETIC GRADIENT VEHICLE DETECTOR

Milton K. Mills, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Mar. 21, 1974, Ser. No. 453,332
Int. Cl.[2] G08G *1/00*
U.S. Cl. 340—38 L 11 Claims

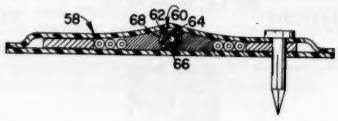


1. In an object detection system of the type which senses metallic structure of objects, the combination comprising:
   an alternating current generator comprising oscillator means having a predetermined oscillation frequency and constant current amplifier means;
   a non-distributed element transmitter radiating electromagnetic energy at the predetermined frequency, said transmitter being electrically coupled to said alternating current generator;
   receiving means being electromagnetically coupled to said transmitter, said receiving means producing a substantially zero magnitude output signal when a metallic object is not magnetically coupled with said receiving means and said transmitter and producing a non-zero level output signal in response to eddy currents induced in a metallic object magnetically coupled with said receiver; and
   indicating means responsive to the output signal produced by said receiving means for signalling when a non zero output signal is produced by said receiving means.

3,911,390
TRAFFIC SENSOR STRIP

Richard H. Myers, 1700 Woods, Arlington, Tex. 76010

Filed Nov. 7, 1973, Ser. No. 413,538
Int. Cl.[2] G08G *1/00*
U.S. Cl. 340—38 R 10 Claims

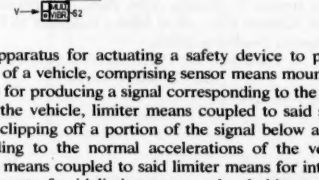


1. A traffic sensor which comprises:
   a. an elongated element which produces an electrical effect when compressed;
   b. a pair of insulating strips enveloping said element with faces of said strips confronting;
   c. a plurality of parallel insulated electrical conductors positioned between said strips and alongside said element, and
   d. a pair of rigid metallic strips bonded to said insulating strips at each edge thereof.

3,911,391
APPARATUS FOR ACTUATING VEHICLE SAFETY DEVICES

Manfred Held, Kuhbach; Johann Spies, Pfaffenhofen, Ulm, and Franz Rudolf Thomanek, Schrobenhausen, all of Germany, assignors to Messerschmitt-Bolkow-Blohm G.m.b.H., Germany

Filed Feb. 28, 1973, Ser. No. 336,791
Claims priority, application Germany, May 5, 1972, 2222038
Int. Cl.[2] B60R *21/08*
U.S. Cl. 340—52 H 7 Claims



1. An apparatus for actuating a safety device to protect passengers of a vehicle, comprising sensor means mounted in the vehicle for producing a signal corresponding to the acceleration of the vehicle, limiter means coupled to said sensor means for clipping off a portion of the signal below a value corresponding to the normal accelerations of the vehicle, integrating means coupled to said limiter means for integrating the output of said limiter means, threshold responsive means coupled to said integrating means for producing an indication when the output of said integrating means exceeds a given level so as to actuate the safety device, pulse generator means coupled to said limiter means for producing two successive pulses and applying them to said limiter means, both of said pulses being greater than the value, the first of said pulses being sufficient to produce an output from said integrating means less than the given level and the second greater than the given level, comparator means coupled to and responsive to the output of said threshold responsive means and said pulse generator means, coincidence gate means coupled to and responsive to the output of said comparator means and to the output of said threshold responsive means, said coincidence gate means being substantially disabled by an output of said comparator means, said comparator means producing a

signal at said coincidence gate means only if a single signal appears at the output of said threshold responsive means, and an alarm indicator coupled to and responsive to said comparator means for producing a signal in response to an output from said comparator means.

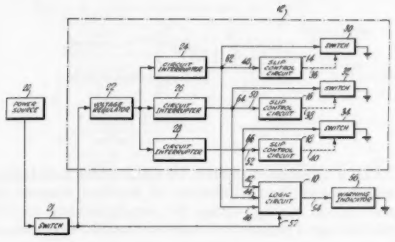
3,911,392
FAILURE/MALFUNCTION WARNING CIRCUIT FOR WHEEL SLIP CONTROL SYSTEMS

Joseph E. Fleagle, Overland, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Continuation of Ser. No. 346,267, March 30, 1973, abandoned. This application Sept. 13, 1974, Ser. No. 505,734

Int. Cl.[2] B60T *8/00*

U.S. Cl. 340—52 B **8 Claims**



1. A slip control system for automotive vehicles, comprising:

a. a plurality of slip control circuits each having a power input terminal;

b. a plurality of means each connected between a power source and the power input terminal of an associated slip control circuit and each operative to interrupt power to said associated slip control circuit by disconnecting the power input terminal from power upon detection of a malfunction in the associated slip control circuit;

c. a plurality of means each operative to connect an associated power input terminal to ground upon detection of a malfunction;

d. logic means having a plurality of logic inputs each connected to the power input terminal of an associated slip control circuit and having an output, said logic means being operative to detect said interruption of power and ground connection and to provide a signal at said output in response thereto; and

e. indicator means connected to said logic means output for indicating said power interruption and ground connection in response to said signal at said output.

3,911,393
VEHICLE SPEED SAFETY SIGNAL SYSTEM

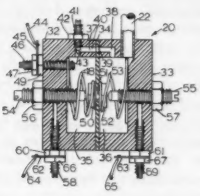
Edward H. Biggs, Bishop Trailer Court, Rte. 1, Slidell, La. 70458

Filed Oct. 10, 1973, Ser. No. 405,001

Int. Cl.[2] B60Q *1/54;* **H01H** *35/34*

U.S. Cl. 340—62 **12 Claims**

1. In an intake manifold pressure change responsive switch: a body enclosing first and second side by side vacuum chambers; flexible diaphragm means separating said chambers and forming a wall of each said chamber; a vacuum line for communicating intake manifold vacuum to a first one of said chambers; fluid bleed passage means comprising a restricted fluid passage channel bidirectionally interconnecting said chambers for balancing fluid pressure differentials between said chambers, said restricted passage channel comprising the only fluid communications passage between said first and second chambers; first and second electric circuit contact make and break means positioned for actuation by respective deflections of said diaphragm in either direction from a neutral position thereof; and circuit means serially connectable with each of said electric circuit contact make and break



means and a first terminal for conducting electric current through an activated one of said first and second circuit contact make and break means and on through switch body walls to respective second and third terminals.

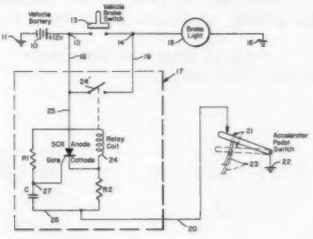
3,911,394
VEHICLE BRAKE WARNING LIGHT SYSTEM

Max Shames, 1213 Preston Way, Venice, Calif. 90291

Filed July 16, 1973, Ser. No. 379,239

Int. Cl.[2] B60Q *1/26*

U.S. Cl. 340—71 **1 Claim**



1. In a vehicle equipped with a battery, a brake light, a normally open brake light switch connected between the battery and brake light, a brake pedal for closing the brake light switch when depressed to thereby energize the brake light, and a foot pressure operated accelerator means for accelerating the vehicle, a vehicle brake warning light system for energizing said brake light for a given time period in response to removal of an operator's foot pressure on the accelerator means comprising, in combination:

a. a normally closed accelerator pedal switch for said foot operated accelerator means responsive to a given pressure applied by the operator's foot to open and responsive to removal of the operator's foot to close;

b. a relay switch connected in parallel across said normally open brake light switch;

c. a relay coil for closing said relay switch when energized and opening said switch when de-energized, one side of said relay coil connecting to said battery;

d. a silicon controlled rectifier switch having anode, cathode, and gate terminals, said anode terminal connecting to said battery and said cathode terminal connecting to the other side of said relay coil so that said silicon controlled rectifier switch is connected across said relay coil in parallel;

e. a resistance and capacitor connected in series between said battery and one side of said accelerator pedal switch, the other side of said accelerator pedal switch connecting to ground, said gate terminal of said silicon controlled rectifier connecting to the junction point between said resistance and capacitor; and

f. an additional resistance connected between said other side of said relay coil and said one side of said accelerator pedal switch, whereby when said accelerator pedal switch is opened in response to foot pressure on said accelerator means, ground is removed from said one side of the accelerator pedal switch so that said silican controlled rectifier switch is open, removal of the foot pressure on said accelerator pedal switch applying ground to said one side of the accelerator pedal switch so that said relay coil is energized by current flow from said battery, through the relay coil and additional resistance to ground to close said relay switch and energize said brake light, said capacitor simultaneously beginning to charge up to battery voltage through its series connected resistance, the voltage charge on said capacitor being applied to the gate of said silicon controlled rectifier switch to cause it to close when a given voltage charge is reached after said given time period and short out said relay coil to thereby open said relay switch to deenergize said brake light, re-application of pressure to said accelerator pedal switch removing ground from said one side of the pedal switch to thereby hold the relay coil de-energized and cause said silicon controlled rectifier switch to open.

3,911,395

CODE ERROR MONITORING SYSTEM

Shin-Ichi Koike, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Filed Mar. 29, 1974, Ser. No. 456,409

Claims priority, application Japan, Mar. 31, 1973, 48-37057

Int. Cl. H04l *1/10;* **G08c** *25/00*

U.S. Cl. 340—146.1 AB **19 Claims**

1. A code error monitoring system for multi-level digital transmission systems capable of transmitting N kinds of input information in the form of multi-level digital signals, where N is an integer not smaller than 3, comprising:

means for converting said N kinds of input information into N corresponding binary input codes;

means for detecting a particular one of said binary input codes;

means for generating two particular binary output codes alternately whenever said particular input code is detected;

means for converting the remaining N−1 kinds of said binary input codes into N−1corresponding binary output codes; and

means for converting said two particular binary output codes and said N−1 binary output codes into corresponding multi-level digital signals; and on the receiving side,

means for regenerating said two particular binary output codes and said N−1 binary output codes;

means for detecting said two particular binary output codes and for providing an error detecting signal when one of said two particular binary output codes is continuously detected;

means for converting said regenerated two particular binary output codes and N−1 binary output codes into said N corresponding binary input codes; and

means for regenerating said input information said converted N binary input codes.

3,911,396

DATA TRANSMISSION SYSTEM

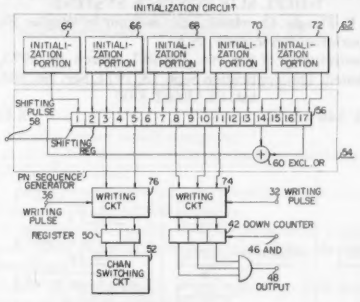
Shinzo Kobayashi, and Takahisa Ohta, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 18, 1973, Ser. No. 425,818

Claims priority, application Japan, Dec. 26, 1972, 48-162

Int. Cl.² H04B *7/00;* **H04Q** *9/00;* **H04L** *5/00*

U.S. Cl. 340—147 SC **5 Claims**



1. A data transmission system for transmitting data between a central station and a plurality of terminal stations, said central station having means for simultaneously receiving signals through a plurality of channels assigned in common to said plurality of terminal stations, wherein the system comprises: control means for controlling the transmission from and the reception by each of said terminal stations including time delay means and channel switching means, said time delay means providing a controlled variable time delay signal for each of said terminal stations, said channel switching means switching different ones of said channels for use by each of said terminal stations; means in each of said terminal stations for transmitting data to said central station through a predetermined one of said channels; said central station being operative to receive the data from each of said terminal stations and to deliver a confirmation signal to each of said terminal stations following the reception of the data, means in each of said terminal stations for responding to the reception of said confirmation signal from said central station to terminate the transmission of data to said central station and for responding to the absence of said confirmation signal from said central station to actuate said time delay means to provide a predetermined time delay signal and also to actuate said channel switching means to switch from said predetermined channel to another predetermined channel; and means in each of said terminal stations responsive to the corresponding time delay signal for re-transmitting said data to said central station through said another predetermined channel after the lapse of said predetermined time delay.

3,911,397

ACCESS CONTROL ASSEMBLY

Charles C. Freeny, Jr., Fort Worth, Tex., assignor to Information Identification Inc., Fort Worth, Tex.

Continuation-in-part of Ser. Nos. 300,098, Oct. 24, 1972, Pat. No. 3,829,833, and Ser. No. 458,330, April 5, 1974. This application May 9, 1974, Ser. No. 468,486

Int. Cl.² H04Q *9/00;* **G08B** *9/00*

U.S. Cl. 340—147 MD **38 Claims**

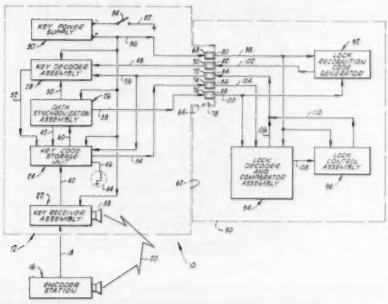
1. An access control apparatus, comprising:

a data synchronization assembly generating an output clock signal;

a key assembly, having a portion storing a predetermined time division binary key code in a code storage mode, a portion of the key assembly generating and providing an output signal having the key code stored in the key assembly encoded therein in a code transmission mode thereof, the key assembly having a portion receiving a signal and

clearing the key code stored in the key assembly in response thereto, the key assembly comprising:

a key code storage unit having a portion storing a predetermined time division binary key code in the code storage mode, the key code storage unit having a portion for receiving the data synchronization assembly clock signal and the key code stored in the key code storage unit being clocked therefrom in response to the received data synchronization assembly clock signal thereby providing a key code storage unit output signal having the key code stored in the key code storage unit encoded therein in the code transmission mode, the key code storage unit having a portion receiving a signal and clearing the key code stored in the key code storage unit in response to the received signal; and



a lock assembly having a portion receiving the key code from the key assembly and providing an output signal in response to receiving a key code from the key assembly for clearing the key code stored in the key assembly, the key code stored in the key assembly being cleared via the lock assembly output signal provided in response to a key code received from the key assembly, the lock assembly comprising:

a lock decoder and comparator assembly having a portion for receiving the key code clocked from the key code storage unit and for receiving the data synchronization assembly clock signal, the received clock signal clocking the received key code into the lock decoder and comparator assembly, a portion of the lock decoder and comparator assembly having a predetermined time division binary lock code encoded therein, and a portion of the lock decoder and comparator assembly comparing the received key code with the lock code and providing one output signal in response to an identical comparison of the received key code and the lock code and providing the output signal for clearing the key code from the key code storage unit in response to a difference between the compared key code and lock code, the lock decoder and comparator assembly comprising:

a decoder shift register receiving the key code from the key code storage unit and the data synchronization assembly clock signal, the received key code being clocked into the decoder shift register via the received clock signal;

a lock code generator having the lock code encoded therein and a portion receiving the clock signal generated via the data synchronizaton assembly, the lock code generator providing the lock code via an output signal in response to a received clock signal;

means receiving the key code from the key code storage unit and the lock code from the lock code generator, comparing the received lock code and the received key code, and providing the lock decoder and comparator assembly output signal indicating a difference between the lock code and the key code for clearing the key code from the key code storage unit;

a format decoder receiving the key code clocked into the decoder shift register and providing an output signal in response to a received key code having a predetermined code format clocked into the decoder shift register; and

means receiving the format decoder output signal and the data synchronization assembly clock signal, said means providing the clock signal to the lock code generator in response to a received format decoder output signal indicating a key code having a predetermined code format clocked into the decoder shift register.

3,911,398

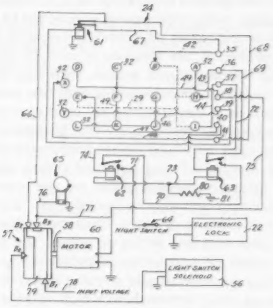
ELECTRONIC CARD KEY LOCK

Frank D. Vogel, II, 1108 36th St., Parkersburg, W. Va. 26101

Filed Jan. 23, 1973, Ser. No. 326,001

Int. Cl. G06k *9/00*

U.S. Cl. 340—149 A **1 Claim**



1. In an electronic lock and card key system, a lock, a card slot for said lock, an electronic card made of insulating material and including a pair of elongate spaced parallel contact strips connected by a cross bar, said strips and cross bar being embedded in the upper surface of the insulating card, such card having a plurality of contact plugs embedded in the upper surface thereof and said contact plugs having indicia contiguous thereto, contact wires embedded in the card connecting certain of said contact plugs together, the connection of the contact plugs being variable from lock to lock so as to make each lock operable with a different circuitry in the card, said slot having a plurality of bores formed in the upper portion thereof, and a circuit board having a plurality of contact members positioned above the slot with the contact members extending downwardly through the bores, the contact members being spring pressed into a portion of the slot and being secured to the circuit board by securing elements, said circuit board having a plurality of terminals arranged along one edge thereof, wires connecting certain of the terminals to certain of said contact members, a circuit including a magnetic switch, a solenoid embodying an armature, a toggle switch connected to said armature by means of a pivoted link, the contact strips of said card being selectively engageable with the contact members in the circuit board to selectively energize the magnetic switch, a spring contact member for actuating said toggle switch, and wherein the opening of the lock occurs only when the correct card is inserted, and an alarm is actuated when a wrong card is inserted.

3,911,399

DIGITAL INCREMENTAL EMITTER, ESPECIALLY FOR NUMERICAL CONTROL OF MACHINE TOOLS

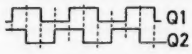
Kurt Maecker, Kreuzstrasse 34, 4 Dusseldorf, Germany

Continuation-in-part of Ser. No. 72,766, Sept. 16, 1970, abandoned. This application Nov. 14, 1972, Ser. No. 306,278

Claims priority, application Germany, Jan. 31, 1970, 2004396

Int. Cl. H04b *3/04*

U.S. Cl. 340—164 R **10 Claims**



1. In combination with a digital-incremental operating resolver system for angle and path measurement with numerical controls, especially for machine tools; pulse resolver digital-incremental control means which for purposes of checking direction furnishes two signal outputs utilized for a mutual check for a correct pulse emission operable to supply independently respective series of signal pulses that are phase displaced relative to each other 90 electrical degrees, warning signal means energizable to produce an error signal, a control circuit including means operatively connected to receive said signal pulses evaluated in alternately processing the two signals and operable in the absence of one of said pulses to energize said warning signal means, with said means effectively there being two pulse systems with two pulse rows in a series of pulses each displaced by 90° used as counting pulses and as monitor pulses respectively which monitor each other while one of said series of pulses represents the counting pulses while another of said series of pulses represents the monitoring pulses, respectively one of the series of pulses maintaining correct counting in case of error, said other series of pulses for monitoring of said control means having a different keying than said one series of pulses, the absence of a pulse from either of said series of pulses being effective to bring about energization of said warning signal means, and an OR gate having input terminals to which said series of pulses are supplied, said OR gate having an output terminal providing counting pulses whereby the monitored presence of a pulse in either of said series of counting and monitor pulses respectively will produce and maintain a correct counting pulse.

3,911,400

DRIVE CONDITION DETECTING CIRCUIT FOR SECONDARY STORAGE FACILITIES IN DATA PROCESSING SYSTEMS

John V. Levy, Maynard; Stephen R. Jenkins, Medford; Victor Ku, Westboro; Peter McLean, Stow, and Thomas N. Hastings, Arlington, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 19, 1974, Ser. No. 462,361

Int. Cl.[2] G06F *13/00*

U.S. Cl. 340—172.5 **13 Claims**

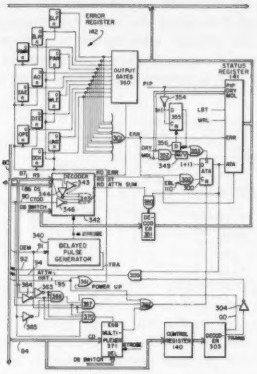
1. A drive including a first register and a second register, said drive being adapted for connection to a controller used in a secondary storage digital data facility including at least one drive and a bus interconnecting a drive and controller, the bus including address lines, data lines and control lines including an attention line common to all drives connected to the controller, and the controller including means for transmitting to a drive over the bus signals for retrieving the contents of said first register, signals for altering the contents of said first register, and signals for tranferring to said second register commands including active transfer commands, said drive additionally comprising:

A. means for transmitting an attention signal,

B. means for enabling the transmitting means in response to predetermined condition in said drive,

C. means for coupling the attention signal onto the attention line in the bus,

D. means responsive to signals from the controller for retrieving the contents of said first register for coupling the attention signal onto a predetermined corresponding data line, each drive connected to a controller coupling the attention signal onto a different predetermined data line



to thereby effect a correspondence between each drive and a data line, and

E. means for disabling said transmitting means including

i. first clearing means responsive to signals from the controller for altering the contents of said first register in response to a signal on a predetermined corresponding data line, and

ii. second clearing means responsive to signals from the controller corresponding to an active transfer command being transferred into said second register.

3,911,401

HIERARCHIAL MEMORY/STORAGE SYSTEM FOR AN ELECTRONIC COMPUTER

Hua-tung Lee, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 4, 1973, Ser. No. 367,046

Int. Cl.[2] G06F *13/00*

U.S. Cl. 340—172.5 **16 Claims**

1. In a hierarchial memory system for use with an electronic computer system wherein said memory system includes a large capacity relatively low speed backing memory store,

a plurality of buffer memories located at different levels having increasingly smaller capacities and increasingly higher accessing speeds, the buffer memory at the lowest level responsive to a central processing unit,

a plurality of buffer memory control means associated wih said buffer memories that coact and control the respective associated buffer memory that include

first transferring means to transfer complete, but of variously defined sizes, pages of data from the backing memory store forward between the said buffer memories,

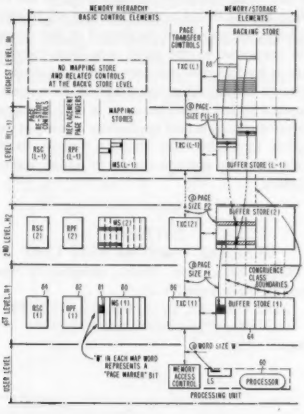
mapping store means associated with each buffer memory to store and, upon inquiry, to indicate the identity and physical location of altered and unaltered page segments of data within said buffer memories,

marker means in the said mapping store means to indicate altered page segments, the improvement comprising

means to interrogate said mapping store means in response to a command from the central processing unit and/or one of the individual buffer memories,

means to indicate buffer memories at upper levels when the requested data is not found in a buffer memory at a certain level,

means to determine that a certain positive responding buffer memory at a specific level to the address search command is the buffer memory at the lowest positive responding level,



means to form a path of expendable pages which are stored in the individual buffer memories between at least the buffer memory at the lowest level containing a data segment called for by the processing unit and the buffer memory at the level responding directly to the processing unit, and

means to initiate said first transfer means to move a data page containing a requested data segment through said path.

3,911,402
DIAGNOSTIC CIRCUIT FOR DATA PROCESSING SYSTEM

Peter McLean, Stow; Stephen R. Jenkins, Medford, and Victor Ku, Westboro, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed June 3, 1974, Ser. No. 475,838
Int. Cl.² G06F *11/04*
U.S. Cl. 340—172.5 **18 Claims**

1. A unit for connection to a bus in a data processing system, said unit comprising:

A. a storage element including

i. data means for receiving and transmitting data, and

ii. means for transmitting timing signals,

B. a register means including a first bistable stage for transmitting a mode signal defining a normal operating mode for said unit in a first state and a diagnostic operating mode in a second state,

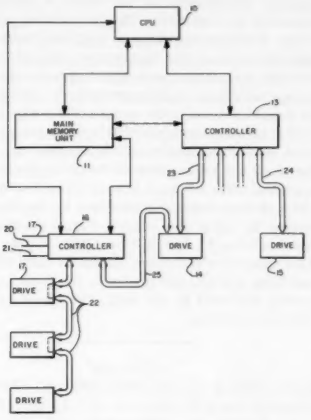
C. a second bistable stage for transmitting a simulated clocking signal,

D. means responsive to signals from the bus for altering the states of each of said first and second bistable stages,

E. a data path for connecting said storage element to the bus, said data path including

i. first selective coupling means responsive to the first and second states of the mode signal from said first bistable stage for coupling signals from, respectively, said timing signal transmitting means and said second bistable stage therethrough as internal timing signals,

ii. second coupling means responsive to the first state of the mode signal for coupling data between said data means and said data path and, in response to the second state of the mode signal, decoupling said data path from said data means, and

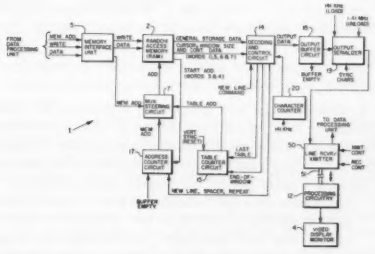


iii. data path control means responsive to the internal timing signals for controlling the transfer of data through said data path.

3,911,403
DATA STORAGE AND PROCESSING APPARATUS

Joseph L. O'Neill, Jr., Haddonfield, N.J., assignor to GTE Information Systems Incorporated, Stamford, Conn.

Filed Sept. 3, 1974, Ser. No. 502,984
Int. Cl.² G06F *3/14, 13/06*
U.S. Cl. 340—172.5 **10 Claims**



1. Data storage and processing apparatus comprising:

storage means having a first section, a plurality of second sections and an output, said first section containing data characters at predetermined successive storage locations therein specified by corresponding addresses and said plurality of second sections each containing a table of information therein, each of the tables of information including start address information specifying the address of the storage location of a particular data character in the first storage section of the storage means and block size information specifying a particular size of a block of data characters, commencing with the data character at the storage location in the first section of the storage means specified by the start address information, to be read out from the first section of the storage means;

first means coupled to the storage means and operative to cause a table of information contained in a second section of the storage means to be read out therefrom and applied to the output of the storage means;

second means coupled to the storage means and operative after the table of information has been read out from its second section of the storage means to receive the start address information of the table of information, and operative in response to the start address information to cause the storage means to read out to its output data characters from the first section thereof commencing with the data character at the storage location in the first section specified by the start address information; and

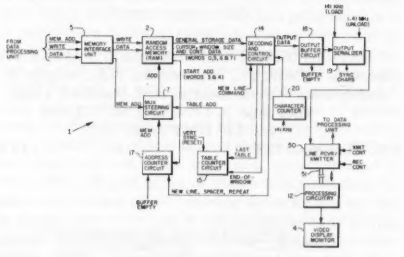
third means coupled to the output of the storage means and operative after the table of information has been read out from its second section of the storage means to receive the block size information of the table of information, and operative after a period of time related to the size of the block of data characters specified by the block size information to cause the second means to discontinue the readout from the first section of the storage means of the data characters following the initial data character read out from the storage means in the location in the first section specified by the start address information of the table information.

3,911,404

DATA STORAGE AND PROCESSING APPARATUS INCLUDING PROCESSING OF NEW LINE CHARACTERS

Joseph L. O'Neill, Jr., Haddonfield, N.J., assignor to GTE Information Systems Incorporated, Stamford, Conn.

Filed Sept. 3, 1974, Ser. No. 502,983
Int. Cl.[2] G06F *3/14, 13/06*
U.S. Cl. 340—172.5 **6 Claims**



1. Data storage and processing apparatus for storing and processing data for use by a display device, said display device displaying coded data characters in a plurality of display lines, said data storage and processing apparatus comprising:

storage means having an output and arranged to store in successive storage locations therein coded data characters including coded new line characters, each of said coded new line characters representing the beginning of a display line of the display device and being preceded in the storage means by coded data characters for the previous display line and followed in the storage means by coded data characters for the next display line;

readout means operative to cause coded data characters stored in the storage means to be read out therefrom in succession and to be applied in succession to the output of the storage means;

new line command means operative to produce new line command signals in succession, each of the new line command signals occurring at the beginning of a display line of the display device;

first means coupled to the readout means and to the output of the storage means and having an input for receiving each new line command signal produced by the new line command means and further having an output, said first means being operative to detect each coded new line character applied to the output of the storage means and in response thereto to inhibit the readout means from causing the further readout of coded data characters from the storage means and operative to cause a special coded data character to be produced at its output;

receiving means operative to receive each special coded data character produced by the first means and having an output; and

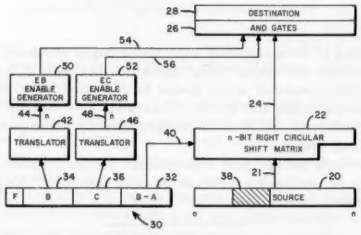
second means operative to cause each special coded data character received by the receiving means to be applied repeatedly to its output until the termination of the special coded data character at the output of the first means; said first means being operative after each special coded data character has been produced at the output thereof and in response to the next new line command signal produced by the new line command means to terminate the special coded data character at its output, whereby the special coded data character is no longer received by the receiving means and applied to its output, and further operative to enable the readout means to permit the readout from the storage means of additional coded data characters.

3,911,405

GENERAL PURPOSE EDIT UNIT

Ralph E. Sipple, Shoreview, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 20, 1974, Ser. No. 452,899
Int. Cl.[2] G06F *5/00, 13/00*
U.S. Cl. 340—172.5 **6 Claims**



1. In a digital data processor, apparatus responsive to the presence of a predetermined instruction word in the instruction register of said processor, said instruction word including a plurality of parameter fields for extracting a field of contiguous bits from any location in a first binary coded word and inserting said field in parallel fashion in a selected location in a second word without affecting any other bits of said second word except in said selected location, comprising in combination:

a. a source register comprising a plurality of bistable stages for storing a first binary coded word;

b. a destination register including a plurality of individual bistable stages adapted to store a second binary coded word;

c. plural gating means individually connected to said plurality of bistable stages of said destination register for entering binary coded information therein when said gating means are enabled;

d. shifting means having input lines and output lines said input lines being connected to said plurality of bistable stages of said source register, said output lines being connected individually to said plural gating means, said shifting means further having a control input adapted to receive a shift count from said instruction register for shifting the contents of said source register a number of bit positions specified by said shift count; and

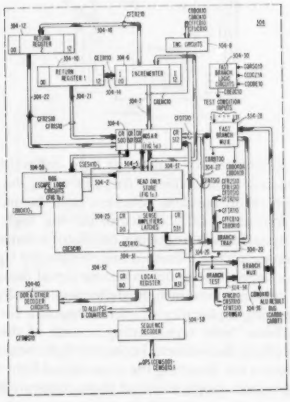
e. enabling means responsive to said plurality of parameter fields of said instruction word contained in the instruction register of said processor, for simultaneously enabling only the gating means corresponding to the individual stages of said destination register which are at and above

a first designated bit position specified by a first of said plurality of parameter fields and at and below a second designated bit position specified by a second of said plurality of parameter fields.

3,911,406
CORRECTION APPARATUS FOR USE WITH A READ ONLY MEMORY SYSTEM

Albert T. McLaughlin, Hudson, N.H., and John A. Recks, Chelmsford, Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Apr. 1, 1974, Ser. No. 457,022
Int. Cl. G06f *9/20, 9/14*
U.S. Cl. 340—172.5 **23 Claims**

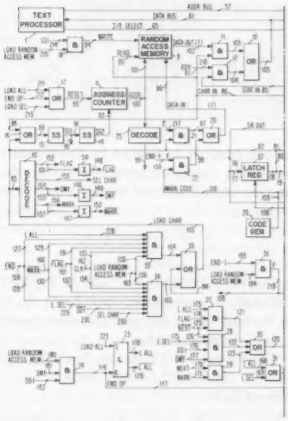


1. A modifiable microprogram store system comprising:
an unalterable read only store including;
a plurality of like constructed addressable sections, a number of said sections including a like number of storage locations for storing microinstruction words, one of said plurality of sections arranged to store a number of addresses for referencing storage locations within a predetermined one of said number of sections and another one of said plurality of sections for storing control signals indicating when a altering of the microinstruction word contents of storage locations in said number of sections is required,
an address register coupled to each of said sections for storing address signals for designating storage locations within said sections selected to be referenced during cycles of operation,
an output register coupled to said sections for receiving the microinstruction word contents of a storage location of said section referenced during a cycle of operation to be executed by said system; and,
control means coupled to said output register and to said address register, said control means including;
logic sensing means connected to be responsive to control signals from said another one of said sections to inhibit a transfer to said output register of the microinstruction word contents of a storage location referenced during one cycle of operation and
address control means coupled to said logic sensing means and responsive to said control signals to load said address register with the address contents of a storage location from said one of said sections addressed during said one cycle of operation for referencing an initial storage location within said predetermined one of said sections for read out during a next cycle of operation of a first substitute microinstruction word to said output register for execution by said system.

3,911,407
TEXT PROCESSING SYSTEM

John Charlie Greek, Jr., Austin; Michael Eudell McBride, Leander, and Howard Carl Tanner, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,756
Int. Cl.² G06F *3/14*
U.S. Cl. 340—172.5 **12 Claims**



1. A system for transferring data to a low data rate processor for preparing text for printing, said system comprising:
a. first memory means being a high data rate recirculting memory for storing data comprised of text character codes and control codes;
b. decode means connected to said first memory means for decoding said control codes;
c. second memory means for storing text character codes and control codes transferred from said first memory means; and
d. transfer control means controlled by instructions output by said processor and upon decode of said control codes by said decode means for causing 1) selected ones of said text character codes and control codes defined by said instructions to be transferred from said first memory means to, and stored in, said second memory means, and 2) a one at a time transfer of said selected text character codes and control codes from said second memory means to said processor when said processor indicates that it is ready.

3,911,408
APPARATUS AND METHOD FOR CONTROLLING A COMMUNICATIONS TERMINAL

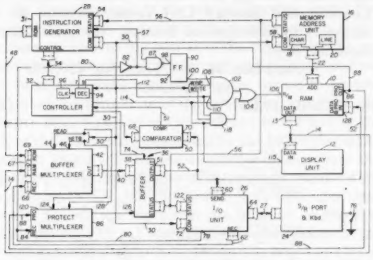
George C. Zobel, Palatine, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Apr. 1, 1974, Ser. No. 457,026
Int. Cl.² G06F *1/00*
U.S. Cl. 340—172.5 **16 Claims**

1. An apparatus for controlling the operation of a communications terminal which serves to manipulate encoded character data comprising:
a selectively addressable random access memory having selected read and write operational modes;
means for addressing said memory to a selected address;
each address location of said memory providing a multilevel word and an extended protect level associated with the

selected word carrying the protect attribute of the encoded character; and

means for inhibiting the write mode of said memory when said memory is addressed to a word location having a



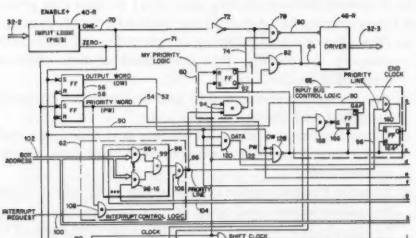
protect attribute as indicated by the signal level of said corresponding extended protect level so that protected information stored in said memory is retained in unaltered form.

3,911,409

DATA PROCESSING INTERFACE SYSTEM

Krzysztof Kowal, Framingham, and Leon S. Malone, Jr., Franklin, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Apr. 23, 1974, Ser. No. 463,335
Int. Cl.[2] G06F *3/00*
U.S. Cl. 340—172.5 **17 Claims**



1. A data processing system comprising:

A. a data processor;

B. a plurality of peripheral interface boxes;

C. full duplex coupling means serially coupled between said data processor and said plurality of boxes in order to provide for the transfer of data between said data processor and at least one of said boxes, said transfer of data repetitively occurring in cycles during each of which cycles an output word is capable of being transferred and a priority word is transferred from said processor and two input words are capable of being transferred to said processor;

D. means, responsive to said priority word and included in each of said boxes, for determining the box which will be allowed to transfer data with said processor during the next one of said cycles;

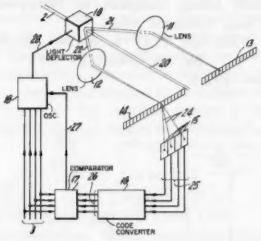
E. means, included in each of said boxes, for enabling said box so determined to transfer data with said processor during said next one of said cycles.

3,911,410

LIGHT DEFLECTION STABILIZING APPARATUS

Yoshinori Ohta; Fujio Saito, and Mitsuhito Sakaguchi, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed May 17, 1974, Ser. No. 471,158
Claims priority, application Japan, June 28, 1974, 48-55884
Int. Cl.[2] G11C *13/04*
U.S. Cl. 340—173 LM **5 Claims**



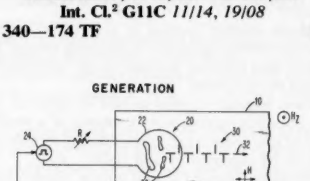
1. An arrangement for stabilizing light deflection comprising: an ultrasonic light deflector for controlling the magnitude of deflection of an incident coherent light beam dependent upon the frequency of a deflector-driving high frequency electronic signal; a high frequency oscillator connected to said deflector for supplying thereto a high frequency signal having a frequency dependent upon an access signal designating the magnitude of the coherent light deflection; a hologram code plate comprising a plurality of mini-holograms for reproducing a light beam train representing a code of the positional coordinate where the deflected coherent light beam is applied; a photodetector for detecting the reproduced light beam train; and a comparator coupled to said photodetector for comparing the output signal of said photodetector with the access signal and for controlling the oscillation frequency of the high frequency oscillator to achieve coincidence between the two signals.

3,911,411

MAGNETIC DOMAIN SYSTEMS USING DIFFERENT TYPES OF DOMAINS

Bernell E. Argyle, Putnam Valley, and John C. DeLuca, Richmond Hills, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,130
Int. Cl.[2] G11C *11/14, 19/08*
U.S. Cl. 340—174 TF **29 Claims**



1. A magnetic domain system comprising:

a magnetic medium having uniform thickness and uniform magnetization over its area in which different types of isolated magnetic bubble domains having single, closed walls can exist simultaneously in the absence of any structure external to the magnetic medium and in the same

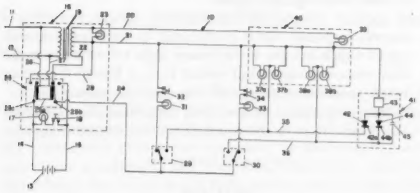
magnetic bias field directed along the magnetization direction of said magnetic medium, said bubble domains having different sizes when viewed optically,

means for generating said bubble domains having different sizes in said magnetic medium.

3,911,412
HIGH AND LOW TEMPERATURE WARNING DEVICE

John F. Bennetts, P.O. Box 127, 1707 Neva Road, Antigo, Wis. 54409

Filed Jan. 17, 1974, Ser. No. 434,072
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—227.1 3 Claims



1. A high and low temperature warning device comprising: a power supply means adapted to be connected to a source of alternating current power and to a source of direct current power and having output terminals, said power supply means providing alternating current power at said output terminals when alternating current power is supplied to said power supply means and providing direct current power at said output terminals when direct current power is supplied to said power supply means and alternating current power is not supplied thereto;

b. high temperature thermostat means for completing a conductive path therethrough if the ambient temperature thereof is above a predetermined high temperature;

c. low temperature thermostat means for completing a conductive path therethrough if the ambient temperature thereof is below a predetermined low temperature;

d. a high temperature visual indicator providing a visible signal when supplied with electrical power;

e. a low temperature visual indicator providing a visible signal when supplied with electrical power;

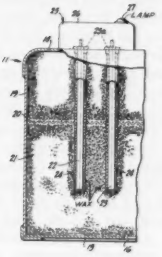
f. audio indicator means for providing an audio signal in response to electrical power supplied thereto which varies in volume in direct relation with the voltage of said electrical power; and

g. circuit completion means for completing a first circuit in series between said power supply means output terminals, said high temperature thermostat means and said high temperature visual indicator, for completing a second circuit in series between said power supply means output terminals, said low temperature thermostat means and said low temperature visual indicator, for completing a third circuit in series between said power supply output terminals, said high temperature thermostat means and said audio indicator means, and for completing a fourth circuit in series between said power supply output terminals, said low temperature thermostat means and said audio indicator means.

3,911,413
THERMALLY ACTIVATED WARNING SYSTEM

Richard A. Wallace, 43 Kingscote Garden, Stanford, Calif. 94305

Filed Feb. 8, 1974, Ser. No. 440,654
Int. Cl.[2] G08B *21/00*; A62B *7/10*
U.S. Cl. 340—237 R 19 Claims

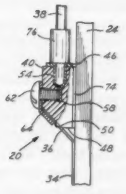


1. In an electrically actuated safety alarm system for detecting and signaling the presence of a selected threshhold level of predetermined toxic gases, a container; electrode means in the form of spaced apart electrodes; an electrically conductive medium disposed in said container between said spaced apart electrodes; chemical means for generating substantial heat on contact with threshhold levels of the said predetermined toxic gases and disposed in said container in gaseous communication with the outside of the container and in thermal communication with at least one of said electrodes; an inert coating on at least said last named one electrode disposed in the region of said electrically conductive medium serving to provide an electrically insulating barrier against contact between said one electrode and said medium, said coating being characterized by high electrical resistance and a melting point no greater than the temperature of heat generated in said container by contact of said chemical means with a threshhold level of a predetermined toxic gas; signaling means connected in series with the electrodes and including means for generating a signal responsive to the melting of said coating whereby said resistance is substantially reduced.

3,911,414
ALARM DETECTOR SWITCH

Roy E. Bowling, 5995 W. 6th Ave., Lakewood, Colo. 80202

Filed May 30, 1973, Ser. No. 365,050
Int. Cl.[2] G08B *13/04*
U.S. Cl. 340—274 4 Claims



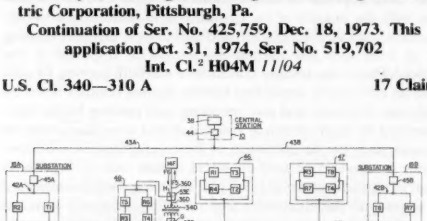
1. In an alarm system adapted to sense movement of a window pane and the like relative to the structure in which the window pane is mounted, said window pane having a strip of conductive foil across portions thereof with one free end of the strip adjacent but in spaced relation to an edge of the window pane, the improvement comprising a detector switch assembly bonded to a face of said window pane adjacent but in spaced relation to said edge of the window pane and in

alignment with said one end of a conductive foil, said assembly including a mounting block having a front beveled surface forming an acute angle with the window pane, said one free end of the strip of conductive foil extending away from said window pane along said front beveled surface, conductive screw fastener means, a clip adjustably anchored to said block by said screw fastener means so that said clip extends along said beveled surface in overlying relationship with said one end of the conductive foil such that when said screw fastener means is screwed onto said block the clip will be drawn tightly against the conductive foil to secure the foil to the block, and a socket extending through the block in a direction parallel to the opening movement of the window having an axial extension contact at one end aligned with an opening in said block for said screw fastening means and the opposite end opening through a surface of the block other than said beveled surface; and a flexible alarm circuit wire including a male plug member on the end of said alarm circuit wire releasably inserted in said socket, said screw fastener means engageable with the axial extension contact of said screw fastener means being tightly screwed into said block, and said clip, socket and screw means all being composed of a conductive material so as to electrically connect the strip of conductive foil with the plug whereby when the window is moved relative to the structure, the male plug will be caused to be released from the socket and thereby energize the alarm circuit.

3,911,415
DISTRIBUTION NETWORK POWER LINE CARRIER COMMUNICATION SYSTEM

Ian A. Whyte, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 425,759, Dec. 18, 1973. This application Oct. 31, 1974, Ser. No. 519,702
Int. Cl.[2] H04M 11/04
U.S. Cl. 340—310 A **17 Claims**

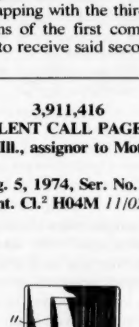


1. A power line communication system for transmitting communication signals over distribution network power line conductors connected between a distribution network substation and a plurality of electric power customers, comprising:
a first communication terminal including transmitter means and receiver means arranged for coupling to said power line conductors at said substation, said transmitter means being operative to transmit a first interrogation signal in a first frequency band modulated by binary logic information signals,
repeater means including first and second channels, said first channel including first receiver means and first transmitter means, said second channel including second receiver means and second transmitter means, said first and second receiver means and said first and second transmitter means being arranged for coupling to said power line conductors,
and a second communication terminal including transmitter means and receiver means arranged for coupling to said power line conductors at one of said plurality of electric power customers, said second communication terminal including decoding and encoding logic circuit means connected to said transmitter means and said receiver means,
said first channel of the repeater means providing a second interrogation signal in response to said first interrogation signal which has the same binary logic information as the first interrogation signal but which is in a second frequency band, non-overlapping with said first frequency band,
said receiver means of the second communication terminal, in response to a second interrogation signal, including means reconstructing the binary logic information signals of the second interrogation signal, and means applying the binary logic information signals to said decoding and encoding logic circuit means,
said transmitter means of the second communication terminal including means operative to modulate binary logic information signals applied thereto from said decoding and encoding logic circuit means, and being further operative to provide a first response signal in a third frequency band which is non-lapping with the frequency band of the second interrogation signal,
said second channel of the repeater means providing a second response signal in response to said first response signal which has the same binary logic information as the first response signal but which is in a fourth frequency band, non-overlapping with the third frequency band,
said receiver means of the first communication terminal being operative to receive said second response signal.

3,911,416
SILENT CALL PAGER

Alvin Feder, Skokie, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Aug. 5, 1974, Ser. No. 492,375
Int. Cl.[2] H04M 11/02
U.S. Cl. 340—311 **8 Claims**



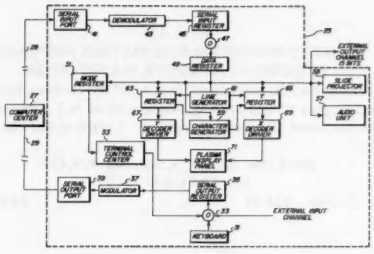
1. A vibratory pager including:
a pager case;
a motor being responsive to receiving a paging signal and being mechanically coupled to said pager case;
drive shaft means attached to said motor and capable of being rotated about an axis of rotation by said motor;
weight means;
connection means for attaching said weight means to said drive shaft means, such that said weight means has a center of gravity with a first distance from the axis of rotation when said drive shaft is not being rotated, and said weight means moves, when said drive shaft means is being rotated, such that the center of gravity of said weight means is a second distance from the axis of rotation, said second distance being larger than said first distance.

3,911,417

METHOD AND APPARATUS FOR PLOTTING LINE SEGMENTS AND CHARACTERS ON A DISPLAY DEVICE

John E. Stifle, Urbana, Ill., assignor to University of Illinois Foundation, Urbana, Ill.

Filed Apr. 27, 1973, Ser. No. 355,009
Int. Cl.[2] G06K *15/18*
U.S. Cl. 340—324 M 20 Claims



1. A method of plotting a line point by point at high speed on a plasma panel, the plasma panel having a plurality of addressable points in an electrode driven matrix array, each of the addressable points corresponding to particualar x and y coordinate electrodes, and means for selectively addressing and driving the electrodes to light certain ones of the addressable points, the point by point plotting on the plasma panel beginning at an origin at the initial coordinates, x_o and y_o, and continuing to an end point at the final coordinates, x_f and y_f, each of the coordinates being identifiable by a corresponding plurality of informational bits, the method comprising:

providing X and Y coordinate registers initially containing the informational bits corresponding to the initial coordinates, x_o and y_o, of the addressable point on the plasma panel corresponding to the origin of the line to be plotted on the plasma panel;

providing X_F and Y_F final coordinate registers initially containing the informational bits corresponding to the final coordinates, x_f and y_f, of the addressable point on the plasma panel corresponding to the end point of the line to be plotted on the plasma panel;

subtracting the bits comprising the initial plasma panel coordinates, x_o and y_o, from the bits comprising the corresponding final plasma panel coordinates, x_f and y_f, in corresponding X and Y ADDERs to obtain the differential quantities, $x_f - x_o$ and $y_f - y_o$, representative of the number of the addressable points in the x and y directions, respectively, between the initial coordinates, x_o and y_o, and the final coordinates, x_f and y_f, of the line to be plotted on the plasma panel, the subtracting including operating the X and Y ADDERs in a parallel data processing mode to process all of the informational bits simultaneously;

providing ΔX and ΔY increment registers for containing the informational bits corresponding to the differential quantities, $x_f - x_o$ and $y_f - y_o$, respectively;

loading all of the informational bits comprising the differential quantities, $x_f - x_o$ and $y_f - y_o$, simultaneously into the corresponding ΔX and ΔY increment registers;

clearing the X_F and Y_F final coordinate registers;

repetitively adding the differential quantity, $x_f - x_o$, contained in the ΔX increment register to the contents of the X_F final coordinate register and the differential quantity, $y_f - y_o$, contained in the ΔY increment register to the contents of the Y_F final coordinate register in the corresponding X and Y ADDERs, the adding including operating the X and Y ADDERs in a parallel data processing mode to process all of the informational bits simultaneously;

loading all of the informational bits comprising the resultant sums simultaneously into the corresponding final coordinate registers after each addition to replace the contents previously contained therein;

monitoring the X and Y ADDERs for overflows resulting during the repetitive adding;

incrementing the appropriate one of the X and Y coordinate registers once whenever the addition results in an overflow in the corresponding ADDER, addition continuing until the contents of the X and Y coordinate registers are equal to the corresponding final coordinates, x_f and y_f, and

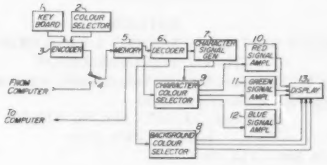
coupling the contents of the X and Y coordinate registers to the addressing and driving means of the plasma panel, the addressing and driving means responsively addressing and driving the particular X and Y coordinate electrodes corresponding to the x and y coordinates contained in the X and Y coordinate registers to light the particular addressable point in the plasma panel corresponding to the coordinates defined by the corresponding X and Y coordinate electrodes.

3,911,418

METHOD AND APPARATUS FOR INDEPENDENT COLOR CONTROL OF ALPHANUMERIC DISPLAY AND BACKGROUND THEREFOR

Minoru Takeda, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation-in-part of Ser. No. 281,029, Aug. 16, 1972, abandoned, which is a continuation of Ser. No. 78,125, Oct. 5, 1970, abandoned. This application Sept. 10, 1973, Ser. No. 395,836
Claims priority, application Japan, Oct. 8, 1969, 44-80940
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 AD 6 Claims



1. In an electron beam tube character display system wherein the characters to be displayed on an electron beam tube are represented by a series of pulse signals comprising a portion of a pulse train, a method for selecting the color of the background against which said characters are to be displayed, comprising the steps of:

representing the background color information as a series of pulses;

inserting a pulse series representing said background color information in a space in said pulse train between two pulse series representing respective characters to be displayed; and

controlling the background color generated by said electron beam tube by said pulse series representing said background color information.

3,911,419

CONTROLLER FOR CURSOR POSITIONING ON A DISPLAY MEDIUM

Roger D. Bates, Sunnyvale, and Butler W. Lampson, Patola Valley, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

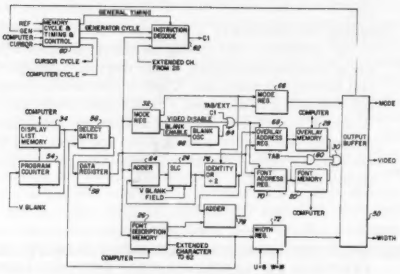
Filed Nov. 23, 1973, Ser. No. 418,505
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 AD 18 Claims

1. A controller for generating signals which provide for a

cursor at a predetermined position on a display screen, comprising

first counting means for synchronously generating first positional signals representing a first positional coordinate for locating the cursor at a first respective position on the display screen,

said first counting means including means for providing an overload signal indicative of the value of the positional signals being greater than the value of said first positional coordinate at said first respective position,



second counting means responsive to said overload signal from said first counting means after said first position is reached for synchronously generating second positional signals representing a second positional coordinate for locating the cursor at the first position and a second respective position on display screen, and

means responsive to said positional signals for generating cursor video signals such that the cursor is displayed at the predetermined position on said display screen.

3,911,420

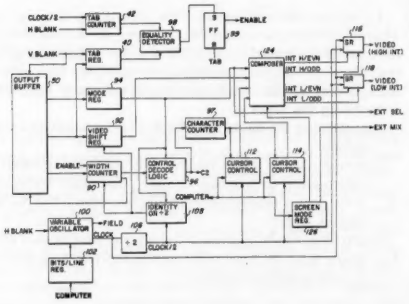
DISPLAY SYSTEM INCLUDING A HIGH RESOLUTION CHARACTER GENERATOR

Butler W. Lampson, Portola Valley, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1973, Ser. No. 418,509

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—324 AD **24 Claims**



1. A device for generating video characters to be displayed on a linear scan video display device, comprising:

first memory means for storing binary information representing a plurality of characters,

said first memory means being comprised of storage cells, each of which stores constant size font definition matrices;

means for processing the binary information stored in said first memory means to characters for display;

second memory means for storing instructions which control the generation of the binary information to be processed; and

means coupled between said first and second memory means for indexing said first memory means such that variant sized matrices are provided to define the displayed characters on the display screen of the display device.

3,911,421

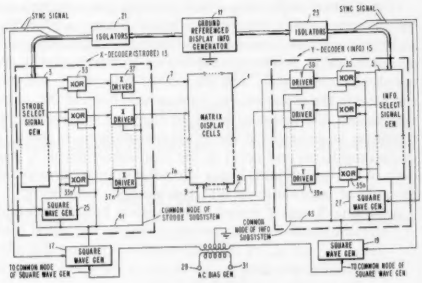
SELECTION SYSTEM FOR MATRIX DISPLAYS REQUIRING AC DRIVE WAVEFORMS

Paul Matthew Alt, Yorktown Heights; Peter Pleshko, Katonah, and Eugene Stewart Schlig, Somers, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,459

Int. Cl.[2] G02F *1/18*

U.S. Cl. 340—324 M **28 Claims**



1. A selection system for producing alternating drive waveforms with substantially zero net direct voltage content across the display cells of a matrix display, comprising:

first drive circuit means for sequentially providing one part of said alternating drive waveforms applied to each of the respective display terminals of one axis of said matrix display, said first drive circuit means including means to provide unipolar pulses and means coupled to said means to provide unipolar pulses to selectively invert said unipolar pulse to provide a first bipolar pulse train having a given direct voltage component, and

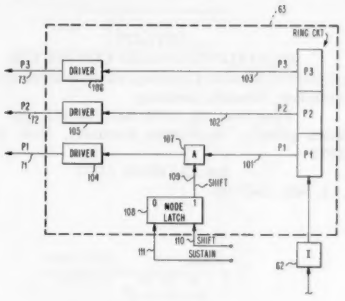
second drive circuit means for providing the other part of the said alternating drive waveforms applied to the display terminals of the other axis of said matrix display, said second drive circuit means including means to provide unipolar pulses for selected ones of said display terminals of the said other axis of said matrix display and means coupled to said means to provide unipolar pulses to selectively invert said unipolar pulses to provide a second bipolar pulse train having said given direct voltage component and having pulses in synchronism with and of opposite phases from the pulses of said first bipolar pulse train, said opposite phase bipolar pulses acting to provide the said alternating drive waveforms with substantially zero net direct voltage content across selected ones of the said display cells of said matrix display with the combined amplitudes of said opposite phase bipolar pulses being sufficient to excite said selected ones of the display cells of said matrix display.

3,911,422

GAS PANEL WITH SHIFTING ARRANGEMENT WITH A DISPLAY HAVING INCREASED LIGHT INTENSITY

Allen W. McDowell, Kingston, and Frank M. Lay, Woodstock, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 4, 1974, Ser. No. 447,595
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 M **9 Claims**



1. A gas panel for storing, displaying and selectively shifting information from one place therein to another comprising:

an envelope filled with an illuminable gas,

a plurality of vertical conductors disposed in parallel on one side of said envelope, a plurality of horizontal conductors disposed in parallel on the opposite side of said envelope orthogonally to the vertical conductors, the illuminable gas in the vicinity of coordinate intersections of the vertical and horizontal conductors defining gas cells,

write circuits coupled to said horizontal conductors for selectively writing in said envelope binary information by ingiting or not igniting the illuminable gas cells to represent binary ones and zeros,

shift circuits coupled to said vertical conductors for selectively shifting binary information from one gas cell to another along the horizontal conductors, and

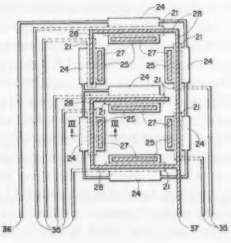
sustain circuit means coupled to the shift circuits for selectively modifying the function of said shift circuits to terminate shifting and also to ignite twice as many gas cells as ignited by the write circuits thereby to increase the intensity of the displayed information.

3,911,423

ELECTRICAL LUMINESCENT DISPLAYS

Horst Arndt, Hazeldean, and Sayman Fadil Demircioglu, Ottawa, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed May 8, 1974, Ser. No. 467,952
Int. Cl.² G08B 5/36
U.S. Cl. 340—324 M **10 Claims**



1. An electrical luminescent display, comprising:

a substrate;

a light emitting device on said substrate and having first and second electrode patterns;

an electrical supply terminal;

a photoconductive semiconductor device electrically connected between said terminal and one of said electrode patterns;

means for applying a pulse to said photoconductive semiconductor device to switch said semiconductor device to a conducting state and connect said terminal to said one of electrode patterns for light emission at one of said first and second electrode patterns;

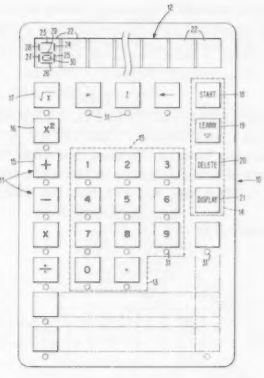
means for impinging light from said light emitting device on said photoconductor semiconducting device to maintain said photoconductor semiconducting device in said conducting state and said light emitting device in light emitting state after cessation of said pulse.

3,911,424

ALPHANUMERIC CHARACTER DISPLAY SCHEME FOR PROGRAMMABLE ELECTRONIC CALCULATORS

Robert J. Giannuzzi, Endwell, N.Y.; Glen G. Langdon, Jr., San Jose, Calif., and Edward Pasternak, Binghamton, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 5, 1974, Ser. No. 503,418
Int. Cl.² G08B 3/14
U.S. Cl. 340—324 R **9 Claims**



1. A programmable calculator apparatus comprising in combination;

character display means;

key means including numeric, function and control keys, said control keys including a display key operable for checking programs stored in said calculator;

individual key indicator means for said numeric and function keys;

storage means for storing coded representations of said numeric and function keys in a program sequence in response to successive operations of said numeric and function keys; and

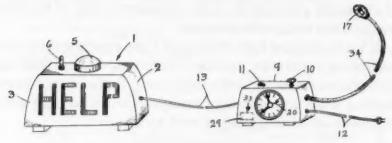
means for checking said coded representations of said numeric and function keys including

control means operable in response to repeated operations of said display key to selectively energize said key indicator means in the program sequence in which said numeric and function keys were operated and to display successive numeric indications of said program sequence on said character display means.

3,911,425
ALARM SYSTEM FOR SIGNALLING FOR EMERGENCY HELP

Hrand M. Muncheryan, 1735 Morningside St., Orange, Calif. 92667

Filed Sept. 5, 1974, Ser. No. 503,446
Int. Cl.[2] G08B 5/00
U.S. Cl. 340—326 12 Claims

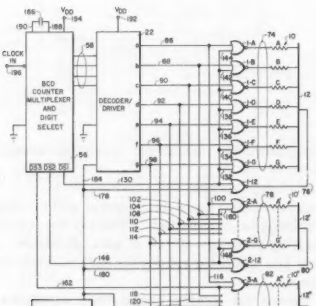


1. An alarm system for signalling for emergency help, comprising: a portable signalling device having therein an auditory and a visual signalling means operable from an electric current source, an operation-interval limiting means having in the electric circuit thereof a system of multiple switches connected in series with the circuit of said auditory and visual signalling means and including a remotely located switching means to control the operation thereof; said auditory and visual signalling means having in the circuit thereof a first means for producing intermittent operation of said auditory and visual signalling means, and a second means adapted to operate said auditory and visual signalling means automatically as well as manually from a remote distance; and, a third means in said operation-interval limiting means for adjustment of time of quiescent operational interval prior to initiation of signalling operation of said portable signalling device.

3,911,426
MULTIPLEXED FIELD EFFECT LIQUID CRYSTAL DISPLAY ACCESSING CIRCUITRY AND SYSTEM

Alcee Gonzague Mouton, Phoenix, and Alvin Pshaenich, Scottsdale, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Nov. 4, 1974, Ser. No. 520,578
Int. Cl.[2] G08B 5/36
U.S. Cl. 340—336 9 Claims



1. Accessing circuitry for a liquid crystal display with a plurality of digits, each digit having a plurality of segments and a back plane which comprises:

a. a source of information to be supplied to the display,

b. a plurality of enabling gates, one for each segment and one for the back plane for each digit of the liquid crystal display,

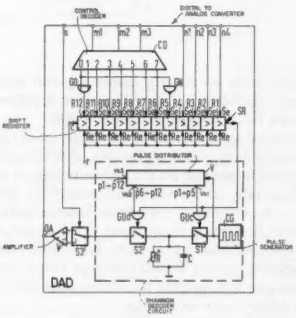
c. a decoder/driver connected between the source of information and the enabling gates for the segments of the liquid crystal display, and

d. means for supplying drive signals and control pulses to the enabling gates, whereby signals equal but opposite in polarity are applied to selected ones of the segments and their back planes and signals of the same polarity and magnitude are supplied to unselected segments and their back planes.

3,911,427
DIGITAL-TO-ANALOG CONVERTER

Max Schlichte, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 28, 1974, Ser. No. 455,663
Claims priority, application Germany, Mar. 30, 1973, 2315987
Int. Cl.[2] H03K 13/02
U.S. Cl. 340—347 DA 7 Claims



1. In a digital-to-analog converter for converting digital signals comprising $n + m + 1$ bits each to analog signals with a non-linear characteristic comprising 2^{m+1} linear segments having 2^n amplitude stages each for use with a coder, whereby the amplitude of the corresponding analog signal is determined by the n+m bits of the digital signal and the polarity of the analog signal by the remaining one bit, the improvement comprising:

a Shannon decoder circuit including RC network having a resistor and capacitor connected in parallel,

clock pulse generator means,

means for charging said capacitor with a constant-current at times determined by the output of said clock pulse generator means and according to the binary one bits in said digital signal, and

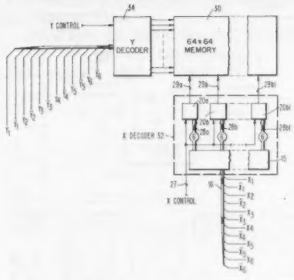
means for connecting said RC network to an output of said converter starting from the lowest order bit of said digital signal, said capacitor being charged at n consecutive timing instants by the n binary one lowest order bits of said digital signal, said means for charging being operable to additionally charge said capacitor at a time immediately following said n consecutive timing instants in the event that at least one of the m bits of said digital signal immediately preceding said n bits in rank is a binary one, the voltage appearing across said capacitor being coupled to the converter output at the time corresponding to $2^n - 1$ consecutive instants determined by the m binary one bits of said digital signal,

and that the voltage applied at the capacitor (c) of the RC network is routed to the decoder output at a timing instant of $2^m - 1$ consecutive timing instants fixed by the m binary —"1" bits of the digital signal concerned.

3,911,428
DECODE CIRCUIT

William Benedict Chin, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1973, Ser. No. 407,681
Int. Cl.² H03K *13/24*
U.S. Cl. 340—347 DD **2 Claims**



1. In a decoder for decoding multi-bit, parallel channel digital input signals into a plurality of single channel output signals for addressing a memory and including: a plurality of decode circuits, a plurality of input lines selectively connected to said decode circuits for operating a single decode circuit during a decode cycle and a control line for generating a signal determinative of the occurrence of said decode cycle, the improvement wherein each said decode circuit comprises:

a set of cascaded field effect transistors of a first channel type;

one of said transistors being rendered conductive by said control signal, the remainder of said transistors individually responsive to one of said input signals;

said set connected between a first reference potential and said decode circuit output line;

a pair of cascoded field effect transistors of a second channel type connected between said output line and a second reference potential;

said first cascoded field effect transistor being rendered non-conductive by said control signal;

said second cascoded transistor being held conductive by said first reference potential and exhibiting a low transconductance;

whereby said first reference potential is connected to said output during a decode cycle when all of said cascaded field effect transistors are operated by said input signals, and said output line is clamped to said second reference potential through said second cascoded transistor when said decode circuit is unselected.

3,911,429
SELF-ENERGIZED MAGNETIC KEYS

Albert Watson Vinal, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,609
Int. Cl.² G08C *1/00*
U.S. Cl. 340—365 L **14 Claims**

14. Apparatus as described in claim 13, wherein:

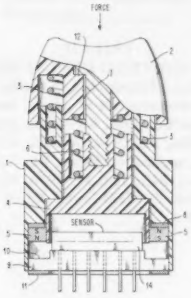
said sensor comprises a switchable polarity, magnetically coupled pair of permanent magnets;

said magnets being separated by a conductive, nonmagnetic barrier;

said magnets being so magnetized as to assume an opposed field vector relationship to one another in the absence of other external magnetic fields, said vectors being switchable to a parallel state upon being subjected to an external magnetic flux field of the proper intensity and direction;

said first permanent magnet being overlain by said nonmagnetic barrier layer; and

said second permanent magnet overlying said barrier layer; and

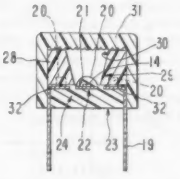


at least one inductive pickup electrical signal producing means adjacent to said magnetically coupled pair of magnets and oriented to be subjected to the switching magnetic field vector of said pair when said switching action of the magnetic vectors occurs in response to said external magnetic flux field, for generating an electrical data signal indicative of the switching taking place.

3,911,430
ALPHA-NUMERIC DISPLAY PACKAGE

Alfred S. Jankowski, San Jose, and John L. Moll, Palo Alto, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Apr. 17, 1974, Ser. No. 461,561
Int. Cl.² G08B *5/36*
U.S. Cl. 340—378 R **3 Claims**



1. An improved package for selectively displaying one of a plurality of alpha-numeric characters using a plurality of light-emitting diodes, each diode having a light-emitting surface providing a point source of light corresponding to a segment of said characters when electrically activated, comprising:

a lead-frame having a supporting portion;

a plurality of light-emitting diodes in the general shape of the necessary segments of all the alpha-numeric characters to be displayed, arranged laterally on said supporting portion of said lead-frame;

a block of plastic material, a first portion of which is beneath and supportive of said supporting portion of said lead frame beneath said diodes, and a second translucent portion of which overlies and is bonded to said diodes and to the part of said supporting portion of said lead frame surrounding said diodes, thereby maintaining said diodes rigidly positioned on said lead frame;

a plurality of translucent lenses formed integral with and of the same material as said second portion of said block of material, one lens being aligned with and adjacent to the light-emitting surface of each of said diodes;

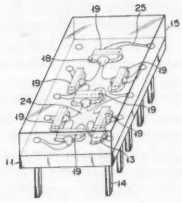
a plurality of light pipes, one above each diode, for transmitting light therethrough; and

a protective cover enclosing all of said diodes, said supporting portion of said lead frame, and at least part of said block of translucent material, thus making a complete enclosure for said diodes.

3,911,431
LIGHT-EMITTING DISPLAY DEVICE

Hiroshi Katsumura, Tokyo; Kei Kaneda, Kawasaki, and Osamu Abe, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 21, 1974, Ser. No. 435,213
Claims priority, application Japan, Jan. 22, 1973, 48-8546; Jan. 31, 1973, 48-11843; Jan. 31, 1973, 48-12801
Int. Cl.² H01J *1/62, 63/04*
U.S. Cl. 340—378 A **8 Claims**



1. A light-emitting display device comprising an electric insulation base plate bearing printed conductive layers; a plurality of light-emitting semiconductor elements bonded to prescribed parts of the base plate to present a desired pattern with the P-N junction of each light-emitting semiconductor element positioned substantially perpendicular to the base plate and each light-emitting semiconductor element having a pair of ohmic electrodes formed on opposite lateral surfaces thereof; a pair of conductive light reflective screens disposed adjacent to and in contact with the ohmic electrodes of each light-emitting semiconductor element; an electric insulation adhesive for bonding each light-emitting semiconductor element to a prescribed part of the base plate; and a conductive adhesive layer for each light-emitting semiconductor element disposed to cover the electric insulation adhesive layer to electrically connect the conductive layers printed on the base plate to the light reflective screens.

3,911,432
TECHNIQUE FOR ELIMINATING MUTUAL INTERFERENCE BETWEEN ADJACENT ASYNCHRONOUS RADAR SYSTEMS

James K. Williams, Fullerton, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 17, 1974, Ser. No. 461,574
Int. Cl.² G10S *9/02*
U.S. Cl. 343—5 R **4 Claims**

1. A method to eliminate mutual interference between two radar systems each system containing a digital processor comprising the steps of:

a. monitoring by each system of the present and future transmission and reception activity of the other system;

b. slaving the digital processor of each system to the same master clock;

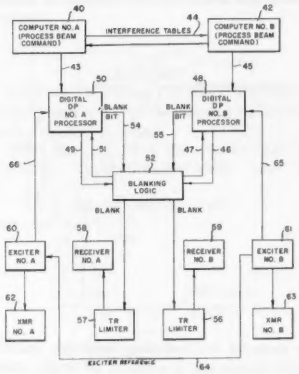
c. synchronizing periodically the operation of the digital processors to a reference signal;

d. when a system desires to transmit a radar beam, comparing its transmission frequency with the transmission frequency of the other system;

e. determining whether the difference between these two frequencies is less than some predetermined number;

f. if these systems are in a search-beam mode and if this difference is less than this predetermined number, blanking the receivers of both systems;

g. if these systems are in a tracking-mode and if this difference is less than the predetermined number, determining whether the transmit and range-gate time of this system



will overlap the transmit and range-gate time of the other system;

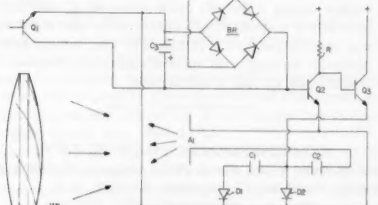
h. if the overlap will occur, determining a time delay so that there will be no overlap of a transmission with a range-gate;

i. inserting this time delay into the timing table of the beam to be transmitted from this system.

3,911,433
INFRARED MICROWAVE TRANSPONDER

Charles M. Redman, Las Craces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 12, 1974, Ser. No. 487,949
Int. Cl.² G01S *7/40, 9/56, 9/64*
U.S. Cl. 343—6 ND **9 Claims**



1. An infrared microwave transponder comprising:

antenna means for receiving through an infrared microwave lens an infrared signal which includes a microwave signal representative of radar reflections,

means for demodulating said infrared signal and generating a microwave signal representative of said radar reflections,

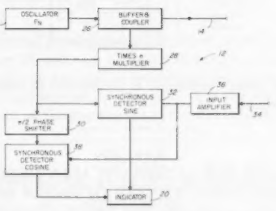
means for attenuating said microwave signal in inverse proportion to the magnitude of said infrared signal, and means for directing an attenuated microwave signal to

said antenna means to cause radiation of said attenuated microwave signal through said infrared microwave lens.

3,911,434
DATA TRANSMISSION SYSTEM EMPLOYING A HARMONIC TRANSPONDER INCLUDING MEANS FOR VARYING PHASE IN RESPONSE TO SURROUNDING CONDITIONS

Edward J. Cook, South Hamilton, Mass., assignor to Tele-Sensors, Inc., Boston, Mass.

Filed Feb. 12, 1973, Ser. No. 331,837
Int. Cl.[2] G01S *9/58*
U.S. Cl. 343—6.5 R **10 Claims**



1. A data transmission system, comprising

a. a transmitter adapted to generate and transmit an original radio frequency carrier signal in the form of a sine wave of a first frequency,

b. a non-linear passive transponder remotely located from said transmitter for receiving said carrier signal, encoding information thereon and reflecting an encoded signal at a second frequency, and,

c. a receiver located remotely from said transponder for receiving said encoded signal at said second frequency said receiver including synchronous detection circuit means for decoding said information from said encoded signal, the distance between said transponder and transmitter being less that the wavelength of said signal,

d. said transponder including a transducer responsive to a physical condition,

e. said transponder including signal encoding circuitry operatively connected to said transducer for altering said carrier signal in accordance with changes in said condition,

f. said signal encoding circuitry including passive harmonic generating means including a rectifier adapted to generate at least one harmonic of said carrier signal and phase varying means responsive to said transducer for varying the phase of the harmonic,

g. said transponder including an inductance and a double pole, three-position switch for connecting said rectifier to said inductance in one of two polar positions and for disconnecting said rectifier from said inductance and said transducer includes pressure responsive means operatively connected to said switch for selectively actuating said switch in response to said change.

3,911,435
DUAL FREQUENCY RADIOMETER

Austin Mardon, 1101 Mission Canyon, Santa Barbara, Calif., and Franklin H. Prestwood, 3482 Lincoln Ave., Valparaiso, Fla. 32580

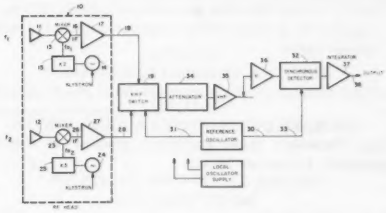
Continuation-in-part of Ser. No. 41,870, June 1, 1970, abandoned. This application June 1, 1971, Ser. No. 150,864
Int. Cl.[2] H04B *7/00;* **G01V** *3/12;* **G01J** *5/00*
U.S. Cl. 343—100 ME **17 Claims**

1. A system for the detection of metal objects in the presence of interfering background including water comprising:

a pair of radiometric receivers including energy receiving ports positioned to receive energy from substantially the same field of view,

one of said receivers tuned to a frequency f_1 and the second of said receivers tuned to a frequency f_2,

means for converting incoming energy at said ports to a common IF frequency,



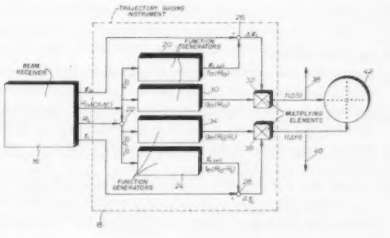
means for sensing the difference in level of energy received at said two frequencies indicative of the presence or absence of metal in the field of view,

said frequencies f_1 and f_2 being characterized as having detectable different apparent sky temperature and approximately identical apparent water temperature.

3,911,436
DEVICE FOR AIRCRAFT TRAJECTORY GUIDANCE

Günther Schänzer, Uberlingen (Bodensee), and Hartmut Heiner Böhret, Uhldingen-Mulhofen, both of Germany, assignors to Bodenseewerk Geratetechnik GmbH, Uberlingen (Bodensee), Germany

Continuation-in-part of Ser. No. 295,820, Oct. 10, 1972, abandoned. This application Aug. 23, 1974, Ser. No. 500,033
Int. Cl.[2] G01S *1/16, 1/18*
U.S. Cl. 343—108 R **17 Claims**



1. In an apparatus for use in determining a desired flight path for an aircraft by using a radio beam between transmitter means at a predetermined location and a receiver on the aircraft, which receiver supplies actual signals indicative of the slant distance and of at least one angle of the aircraft from said transmitter means, said apparatus including trajectory computer means connected to said receiver to receive said slant distance signal and in response thereto to generate command signals establishing a flight path for the aircraft, which flight path includes portions which are not radial to the transmitter means, the improvement wherein said trajectory computer means comprises:

function generator means to supply, in response to said slant distance signal, a command angle signal indicative of the value of said one angle were the aircraft on a desired trajectory at said slant distance,

means for comparing said command angle signal to said actual angle signal to produce an angle deviation signal

for use in keeping the aircraft substantially on said desired trajectory,

a second function generator means connected to receive said slant distance signals and in response thereto to supply an output signal which is a preselected function of the slant distance signal, said preselected function, at least in a range of small slant distances, increasing with increasing slant distance, and

multiplying means connected to said comparing means and to said second function generator to produce a command signal as the product of the angle deviation signal and said output signal.

3,911,437

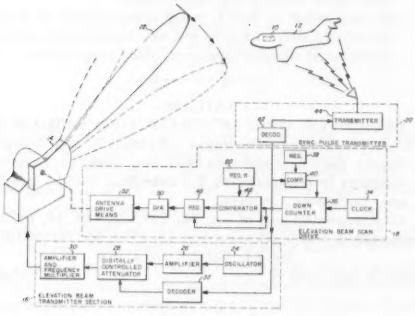
AIRCRAFT INSTRUMENT LANDING SYSTEM

George Ploussios, Andover, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 21, 1974, Ser. No. 435,390

Int. Cl.[2] G01S *1/44*

U.S. Cl. 343—108 M **8 Claims**



6. In combination:

a. means for sweeping a beam of radiation through various angles during a portion of a sweep period and for inhibiting the beam of radiation from being swept through elevation angles between a local horizontal and a predetermined elevation angle during another portion of such sweep period; and

b. means for varying the amplitude of the radiation in the transmitted beam of radiation in a predetermined manner during the time such beam is inhibited from being swept.

3,911,438

PROXIMITY SENSING DEVICE

Donald S. Banks, Wellesley, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 31, 1966, Ser. No. 576,784

Int. Cl.[2] F42C *13/04*

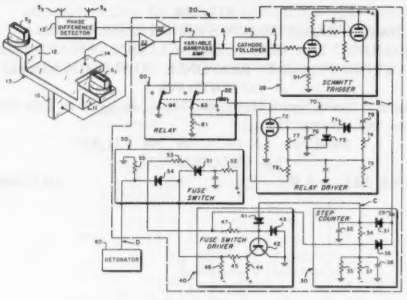
U.S. Cl. 343—113 R **11 Claims**

1. Apparatus for detonating an explosive warhead in a missile in lethal proximity to a target which is emitting a jamming signal comprising:

antenna means adapted to be carried by the missile for sensing the target emitted jamming signal;

means connected to said antenna means and responsive to the jamming signal sensed for providing an output signal having a frequency which varies as a function of target bearing relative to the missile; and

detonation signal producing means connected to said jamming signal responsive means for receiving said output signal and responsive thereto for providing a detonation signal to the warhead when the missile is positioned in lethal proximity to the target.



3,911,439

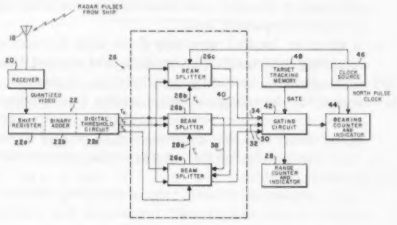
APPARATUS FOR AUTOMATICALLY DETERMINING THE BEARING CENTER OF RADAR BEAMS

Dean R. Sullivan, Lakeside, and John D. Vinatieri, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 22, 1971, Ser. No. 117,696

Int. Cl.[2] G01S *3/16*

U.S. Cl. 343—118 **5 Claims**



5. A method for automatically determining the bearing center of a received radar beam comprising the steps of:

converting said beam into a quantized video signal;

time-correlating said quantized video into a hit sequence having a predetermined leading edge and trailing edge;

counting the number of hits in said sequence between said leading edge and trailing edge;

dividing the count of said number of hits in half whereby the median of the number of said hits essentially comprises the bearing center of said beam.

3,911,440

ANTENNA FEED SYSTEM

Motoo Mizusawa, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 302,906, Nov. 1, 1972, abandoned. This application July 15, 1974, Ser. No. 488,824

Claims priority, application Japan, Nov. 8, 1971, 46-88934

Int. Cl.[2] H01Q *19/10*

U.S. Cl. 343—755 **6 Claims**

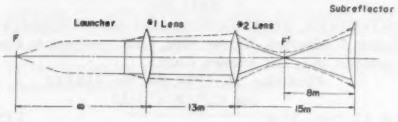
1. An antenna feed system having minimal beam width deviation as a function of frequency, comprising:

at least two phase modifying means coupled in series,

one of said phase modifying means having a characteristic parameter *t* defined by the equation:

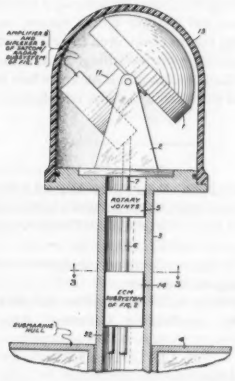
$$t = \frac{Da^2}{8\lambda}\left(\frac{1}{L_s} - \frac{1}{L_f}\right)$$

wherein Da is the diameter of the effective aperture of said one phase modifying means, λ is the wavelength of the signal passing through said antenna feed system, Ls is the distance between said two phase modifying means and Lf is the distance between the focal point of the wave front of said signal and the center of said one phase modifying means; and



the other of said two phase modifying means is characterized by a parameter t', wherein t' has the same absolute magnitude as the parameter t, but the opposite polarity.

3,911,441
MULTIPURPOSE ANTENNA SYSTEM FOR A SUBMARINE
Ira S. Stein, Fairlawn, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed Oct. 9, 1973, Ser. No. 405,719
Int. Cl.[2] H01Q 1/34
U.S. Cl. 343—709 **15 Claims**

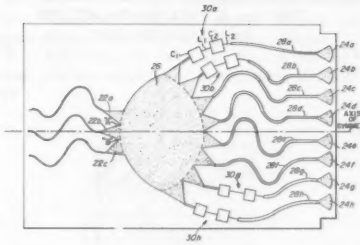


1. A multipurpose antenna system for a submarine comprising:
- a hollow mast capable of movement into and out of a submarine hull;
- a first antenna system mounted at the top of said mast, said first antenna system being capable of transmitting and receiving at least a first type of electromagnetic radiation; and
- a second antenna system having a plurality of different antennas spaced with respect to each other and flush mounted with respect to the outer surface of said mast around the circumference of a transverse cross-section of said mast below said first antenna system, said second antenna system being capable of at least receiving a second type of electromagnetic radiation;

each of said plurality of different antennas including
- an antenna arrangement capable of receiving left-hand and right-hand circularly polarized second type of electromagnetic radiation;

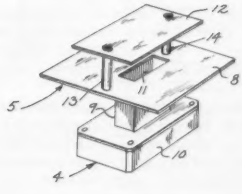
said antenna arrangement including
- a substrate extending radially into the wall of said mast to a given point spaced from the outer surface of said mast,
- spiral type antenna elements printed on the surface of said substrate adjacent said given point, and
- a protective cover transparent to said second type of electromagnetic radiation disposed over said printed antenna elements, the outer surface of said protective cover being flush with the outer surface of said mast.

3,911,442
CONSTANT BEAMWIDTH ANTENNA
William B. Hatch, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.
Filed Feb. 15, 1974, Ser. No. 442,704
Int. Cl.[2] H01Q 19/06
U.S. Cl. 343—754 **3 Claims**



1. In an antenna assembly for providing a plurality of directive beams of electromagnetic energy, such beams being formed by interference between electromagnetic energy radiated from an array of antenna elements symmetrically disposed about an axis of symmetry, comprising a printed circuit lens having an irregular geometrical shape in selected ones of the different constrained paths between the array of antenna elements and the like plurality of feedports, for varying, in accordance with the frequency of the electromagnetic energy, the amplitude of such electromagnetic energy only in the selected ones of the different constrained paths.

3,911,443
SPLIT BEAM ANTENNA APPARATUS FOR DEVELOPING ANGULARLY ORIENTED BEAMS
Lawrence B. Korta, Hales Corners, and Charles E. Seaks, Jr., Greenfield, both of Wis., assignors to Johnson Service Co., Milwaukee, Wis.
Filed Nov. 28, 1973, Ser. No. 419,494
Int. Cl.[2] H01Q 19/14
U.S. Cl. 343—767 **17 Claims**



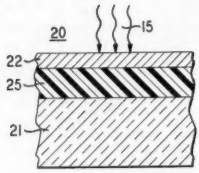
1. A beam splitting antenna apparatus for developing selected angularly related operating radiation lobe means comprising a hollow rectangular waveguide terminating in a slot opening in a finite essentially planar ground plane member terminating in outer free space edges, said waveguide and

ground plane member forming a slot radiator developing a radiation pattern inclusive of the slot axis and to the opposite sides of the axis with the pattern projecting laterally outwardly of said free space edge, and a rectangular, planar reflector generally corresponding to the slot opening of the waveguide, mounting means fixedly mounting said reflector in outwardly spaced overlying relationship to said ground plane member with the reflector overlying the slot opening and the adjacent ground plane member and spaced from said slot opening and said ground plane to control the radiation pattern on the axis of the slot and thereby the angularly offset radiation lobes.

3,911,444
METAL FILM RECORDING MEDIA FOR LASER WRITING

David Yuan Kong Lou, Chatham; Hugh Alexander Watson, Berkeley Heights, and Ronald Howard Willens, Warren Township, Somerset County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 4, 1974, Ser. No. 457,788
Int. Cl.[2] G01D *15/34*
U.S. Cl. 346—1 **6 Claims**

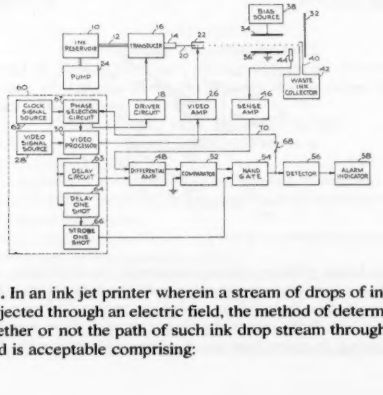


1. A method for recording information in a metal film recording medium by selectively removing portions of a thin radiation absorbing film supported on a flexible transparent substrate, the method comprising exposing the radiation absorbing film to modulated coherent radiation of sufficient energy and duration to remove the portions, and CHARACTERIZED IN THAT the recording medium has a plastic layer of a poly-alkyl methacrylate interposed between the substrate and the radiation absorbing film.

3,911,445
INK DROP STREAM INTEGRITY CHECKER IN AN INK JET PRINTER

John E. Foster, Glenview, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed Sept. 25, 1974, Ser. No. 509,066
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—1 **7 Claims**



1. In an ink jet printer wherein a stream of drops of ink are projected through an electric field, the method of determining whether or not the path of such ink drop stream through said field is acceptable comprising:

generating signals representative of the modulation of said field as an ink drop stream passes therethrough,

establishing reference signals representative of an acceptable modulation of said field,

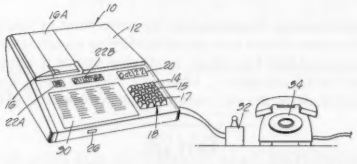
comparing said generated signals with said reference signals and producing output signals as a result, and

displaying said output signals.

3,911,446
AUTOMATIC TIMEKEEPING AND ACCOUNTING UNIT

Eugene J. Albertini, Hidden Hills, Calif., assignor to Chronometrics, Inc., Los Angeles, Calif.

Filed Mar. 26, 1974, Ser. No. 454,811
Int. Cl.[2] G07C *1/10*
U.S. Cl. 346—33 R **3 Claims**

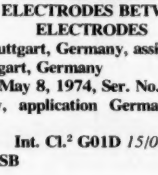


1. An automatic timekeeping and accounting unit including manually operated means for establishing indicia representing an account and for establishing indicia representing a work activity; a clock means for establishing the time interval in which a particular work activity occurred; recording means coupled to said manually operated means and to said clock means for recording the aforesaid indicia; a telephone switching curcuit connected to said clock means; and manually operated switching means connected to said telephone switching circuit to activate said switching circuit and cause said switching circuit to stop the clock means when the switching means is actuated to indicate that the telephone is being operated.

3,911,447
ELECTROGRAPHIC WRITING APPARATUS FOR A METALLIZED STRIP RECORDING MEDIUM USING GROUNDED ELECTRODES BETWEEN WRITING ELECTRODES

Alfred Ortlieb, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 8, 1974, Ser. No. 467,891
Claims priority, application Germany, May 10, 1973, 2323484
Int. Cl.[2] G01D *15/08*
U.S. Cl. 346—74 SB **1 Claim**



1. Apparatus for writing on a recording medium having a metallic layer subject to electrical burnout marking on a carrier web, which apparatus comprises:

a plurality of writing electrodes (**21,31**) insulated from each other arranged for simultaneous contact with the metallic layer of said recording medium,

circuit means (**25,37**) for applying a burnout voltage during writing periods and a grounding potential during a non-writing period to the respective writing electrodes (21,31) and for applying a grounding potential continuously to the metallic layer along a line substantially equally spaced from said writing electrodes, and

a plurality of continuously grounded electrodes (**32**) respectively located between each adjacent pair of writing electrodes and arranged to make contact with said metallic layer, whereby distortion of the record through inter-electrode short-circuits is prevented.

3,911,448

PLURAL LIQUID RECORDING ELEMENTS

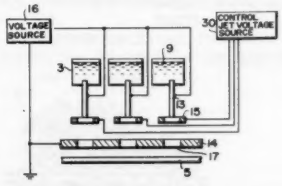
Genji Ohno, Yokohama; Tadamitsu Uchiyama, Tokyo; Seisaku Ohki, Tokyo, and Hishao Morohashi, Tokyo, all of Japan, assignors to Research & Development Laboratories of Ohno Company Limited, Japan

Filed Nov. 20, 1973, Ser. No. 417,543

Claims priority, application Japan, Nov. 22, 1972, 47-117459; Nov. 22, 1972, 47-117460; Nov. 24, 1972, 47-117736

Int. Cl.² G01D *15/18*

U.S. Cl. 346—140 **15 Claims**



1. A recording apparatus comprising:

a plurality of recording elements, each thereof comprising a hollow tubular nozzle having an outlet end for dispensing a liquid imaging material;

means for supplying said liquid imaging material to said plurality of recording elements;

a recording member disposed in close, opposing relationship to said recording elements adjacent said dispensing outlet ends thereof;

means for advancing said recording member relative to said recording element;

said plurality of recording elements being arranged relatively to one another and to said recording member so that images formed by said recording elements on the surface of said recording member are arranged in spaced, parallel relationship corresponding to the relative spacing of said recording elements in a direction transverse of said recording member; and

electrically operated control means responsive to an image to be reproduced and operatively associated with said recording elements for selectively controlling the dispensing of said liquid imaging material from the outlet ends of each of said recording elements for application of said liquid material to said relatively advancing recording member in an assemblage of rows of intermittent linear marks arranged in said transversely spaced, parallel relationship corresponding to the arrangement of said recording elements relatively to one another, said control means including for each said recording element:

an electrode plate having a through hole coaxial with the nozzle outlet end and disposed between said nozzle and said recording member;

a ring disposed coaxially with said nozzle adjacent said nozzle outlet end;

means for applying a voltage between said nozzle and said electrode plate to establish an electric field therebetween thereby to direct a convergent jet of said liquid imaging material through the through hole of said electrode plate and onto said advancing recording member; and

means for applying intermittently a voltage to said ring in response to said image to be reproduced of the same polarity as said voltage applied between said nozzle and said electrode plate for reducing the said electric field established thereby and stopping the jet, thereby to form a reproduction of said image on said recording member.

3,911,449

SWITCH ARRANGEMENT FOR ELECTRONIC SHUTTER OF CAMERA

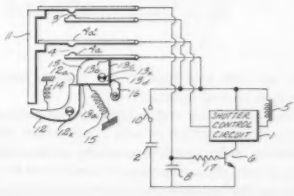
Koichiro Watanabe, Funabashi, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 17, 1973, Ser. No. 397,985

Claims priority, application Japan, Sept. 21, 1972, 47-109949

Int. Cl.² G03B *7/08*

U.S. Cl. 354—50 **3 Claims**



1. In a camera having a releasable shutter mechanism, first-stage acting members that move in an initial stage of shutter release operation, an exposure-time control arrangement for controlling the shutter mechanism, the shutter mechanism having leading and follower shutter curtains with the leading curtain being operative to run upon movement of the first-stage acting members and having an electrically controllable magnet for initially holding and then releasing the follower shutter curtain to run behind the leading shutter curtain, the combination comprising:

a timing switch movable between first and second positions, the first position being a normally disabling position and the second position being an enabling position, the timing switch being coupled to the first-stage acting members so that upon the start of movement of the first-stage acting members the timing switch moves successively from its normally disabling position to its enabling position and then returns to its normally disabling position before the follower shutter curtain begins to run;

a shutter control circuit;

a controllable current supply circuit for the shutter control circuit;

switching means for controlling the current supply circuit so that it is operative to supply current after the first-stage acting members begin to move; and

the shutter control circuit having an input connected to the timing switch and an output connected to the electrically energizable magnet to gate energization current supplied through the supply circuit to the magnet, said gating of energization current commencing immediately upon closing of the timing switch to the enabling position so that the follower curtain is initially held while the leading curtain is running, the shutter control circuit being disabled from commencing to gate such energization current

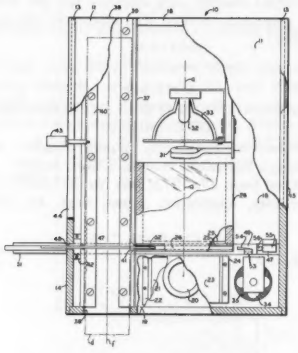
while the timing switch is in its normally disabling position, thereby diminishing the drain of current.

3,911,450

FRONT PROJECTION APPARATUS

Jay Martin Schwartz, Creve Coeur, Mo., assignor to Chromalloy Photographic Industries, Inc., St. Louis, Mo.

Filed May 20, 1974, Ser. No. 471,210
Int. Cl.² G03B *29/00, 21/26;* **A63J** *5/00*
U.S. Cl. 354—77 **2 Claims**



1. For use with that type of still camera which utilizes an electrically operated shutter,

front projection apparatus having conventional projection components, certain of said components being mounted within a walled enclosure along a normally horizontal optical axis, the components so mounted including a flash tube for background projection during picture taking and means to provide forwardly thereof projection slide positioner means, said apparatus further including forwardly of the projection slide positioner means, conventional means to bend the optical axis first to a 45° beam splitter forwardly of such camera and thence into coincidence with the optical axis of such camera, and electrical means to operate said flash tube and the shutter of such camera synchronously, said front projection apparatus being characterized in having

a tunnel within said walled enclosure laterally outward of and having a tunnel axis extending parallel to said optical axis,

means to move and position along said tunnel axis a holder of slides maintained by the tunnel parallel to its axis, whereby a selected slide may be positioned and aligned laterally adjacent to said projection slide positioner means,

means to transport such slide from the tunnel axis to a laterally inward position coincident with said projection slide positioner means on said optical axis, and

switch means, responsive to said slide transport means, to permit such synchronized operation only when said slide transport means is in said laterally inward position.

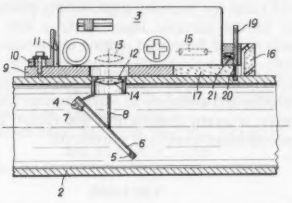
3,911,451

COMBINED TELESCOPE AND CAMERA SIGHT

Karl Vockenhuber, Potzleinsdorferstrasse 118, Vienna 18, Austria

Filed Nov. 7, 1973, Ser. No. 413,427
Claims priority, application Austria, Nov. 8, 1972, 9471/72
Int. Cl.² G03B *17/48*
U.S. Cl. 354—79 **9 Claims**

1. A telescopic gun sight comprising a sighting telescope defining an axis for a sighting beam, a beam splitting assembly inside the telescope and diverting laterally part of said sighting beam, a collimator on which the laterally diverted beam part is incident and providing collimated light therefrom, means defining a window in the telescopic wall through which light from the diverted beam part passes, a camera mounting device external to the telescope having coupling means for removably receiving a fixed lens camera, and a fixed lens camera removably mounted in said coupling means with its lens aligned with and receiving light from said collimator, said coupling means having adjustable clamps to enable cameras of different sizes to be held by said device.

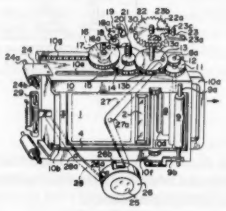


3,911,452

SELF-PROCESSING CAMERA

Hiroshi Ueda, Nara, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 30, 1974, Ser. No. 493,196
Claims priority, application Japan, Aug. 1, 1973, 48-85868; Aug. 4, 1973, 48-87240
Int. Cl.² G03B *17/50*
U.S. Cl. 354—83 **12 Claims**



1. In a self-processing camera including an exposure chamber adapted to mount therewithin a film unit casing containing a plurality of film units, said film units each having a separable image recording unit, a rupturable portion containing a processing agent on one side of said image recording unit, and a trap for receiving excessive processing agent on the other side thereof, said film unit casing having a front exposure opening, a film unit outlet opening adjacent said exposure opening, and a film unit inserting opening, located rearwardly of said outlet opening, the improvement which comprises:

a film unit transporting frame movable relative to the exposure chamber between a first set position within the exposure chamber and a second withdrawn position outside the exposure chamber, means on said transporting frame for engaging the single frontmost film unit in said casing when said frame is in the first set position, and for transporting said single film unit out through said outlet opening of said casing when said frame is shifted to said second position from said first position, means on said frame for moving the trailing end of said single film unit to a position aligned with said inserting opening when said frame has reached said second position, whereby, when said transporting frame is shifted back from said second position to said first position, said film unit is carried thereby through said inserting opening, to a position within said film unit casing;

pressure members mounted within said exposure chamber in pressure-contacting relation to each other adjacent to said outlet opening, and adapted to rupture the processing-agent-containing portion of the film unit being transported, thereby distributing processing agent to the image recording unit of said transported film unit when said transporting frame is shifted from the first position to the second position;

a rotary member operatively associated with said frame and adapted to rotate when said frame is moved between its first and second positions and to detect a position of said transporting frame;

reverse motion preventive members for preventing reverse motion of said transporting frame during the shift of said frame from the first position to the second position, said reverse motion preventive members releasing said frame from the reverse motion-prevented condition when said frame is in said first position and in said second position; and

means for separating the image recording unit from the film unit, and for discharging the image recording unit to the outside of the exposure chamber, when said transporting frame is shifted from the second position to the first position.

3,911,453

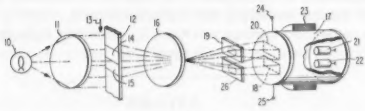
TWO COLOR INFORMATION RECORD

Robert Earl Flory, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 293,800, Oct. 2, 1972, Pat. No. 3,812,528. This application Nov. 30, 1973, Ser. No. 420,504

Int. Cl.² G03B *15/00*

U.S. Cl. 354—100 **2 Claims**



1. A method of producing an information record containing superimposed frames of information, said method comprising the steps of:

exposing with a selected wavelength of light a given region of a first layer of a multilayer information record to an image of a first monochromatic record containing luminance information from a frame of color film;

exposing with said selected wavelength of light a region of a second layer of said multilayer information record, in substantial registry with said given region of said first layer, to an image of a second monochromatic record containing color information of said frame of said color film as encoded monochromatic spatial modulations; and

developing said exposed layers to form said information record such that said first and second layers contain, in superimposed relationship, said respective first and second images of said respective first and second monochromatic records as density variations of respective dyes of respective first and second substractive colors.

3,911,454

QUICK RETURN MIRROR DEVICE IN A SINGLE LENS REFLEX CAMERA

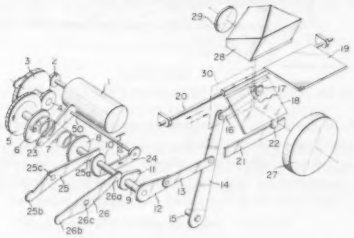
Sachio Ohmori, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sept. 13, 1973, Ser. No. 396,736

Claims priority, application Japan, Sept. 22, 1972, 47-94638

Int. Cl.² G03B *19/12*

U.S. Cl. 354—154 **4 Claims**



1. A movable mirror for use in a single lens reflex camera, comprising;

a mirror movable in a direction parallel to a film surface and across the optical axis of the camera between a first position in the path of light rays passing through a photographic lens to view finder means and to prevent said light rays from reaching said film surface and a second position out of the path of said light rays whereby such rays reach said film surface;

means for maintaining said mirror substantially at an angle of 45° to the optical axis of said camera;

a shield plate movable between a first position entirely withdrawn from a view finder aperture and a second position in front of said view finder aperture;

a driving shaft;

a drive spring for rotating said driving shaft in one direction only by energy accumulated therein;

a motor for accumulating energy in said driving spring;

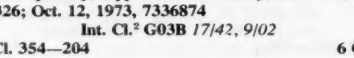
link means responsive to movement of said driving shaft for moving said mirror and said shield plate, the link means effecting a first link motion in which each of said mirror and said shield plate is moved from said first position to said second position during a half rotation of said driving shaft and a second motion in which each of said mirror and said shield plate is moved from said second position to said first position by a further half rotation of said driving shaft; and

means for controlling said driving shaft, the control means functioning to stop said driving shaft when each of said mirror and said shield plate is in said first position, to release said driving shaft to effect said first motion of said link means under accumulated energy of said spring when the shutter of said camera is actuated, to stop said driving shaft so as to maintain said mirror and said shield plate in their respective second positions until completion of exposure of a predetermined time, and to release said driving shaft to effect said second motion of said link means after the completion of the exposure.

3,911,455
CAMERA RESET MECHANISM UTILIZING A LENS DIAPHRAGM AS A LIGHT SHIELD

Helmut Ettischer, Ruit, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1974, Ser. No. 493,572
Claims priority, application Germany, Oct. 12, 1973, 2351326; Oct. 12, 1973, 7336874
Int. Cl.² G03B 17/42, 9/02
U.S. Cl. 354—204 6 Claims



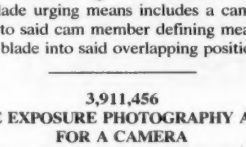
5. A camera as set forth in claim 4 wherein said reset member includes means defining a cam member; and

said first blade urging means includes a cam follower responsive to said cam member defining means for urging said first blade into said overlapping position.

3,911,456
MULTIPLE EXPOSURE PHOTOGRAPHY ASSEMBLY FOR A CAMERA

Yukio Umemura, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Dec. 21, 1973, Ser. No. 427,215
Claims priority, application Japan, Dec. 30, 1972, 48-454
Int. Cl.² G03B 19/32
U.S. Cl. 354—209 2 Claims



1. A multiple exposure photographic assembly for a camera having a shutter charge mechanism and a film winding mechanism wherein said film winding mechanism includes a ratchet means for driving a film spool and a claw means mounted for rotation on a winding lever for engaging said ratchet means which comprises:

an actuation plate means slideably mounted on said camera proximate to said film winding mechanism for selectively disengaging said claw means of said film winding mechanism after film exposure, said actuation plate means including first and second pin means, said first pin means disengaging said claw means from said ratchet means upon movement of said actuation plate means into operational mode; and

an arrester plate means rotatably mounted on said camera to lock said actuation plate means in operational mode by engagement with said second pin means, said arrester plate means being in contact with said claw means in operational mode whereby rotational movement of said claw means in response to said winding lever causes said arrester plate means to move out of disengagement with said second pin means and thereby return said actuation plate to an initial position.

3,911,457
VIEWFINDER FOR SINGLE LENS REFLEX CAMERAS INCLUDING MEANS TO VIEW EXPOSURE GUIDES

Youichi Okuno, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Japan

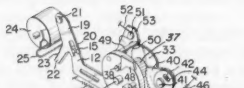
Filed Jan. 31, 1973, Ser. No. 328,294
Claims priority, application Japan, Feb. 7, 1972, 47-13429; May 11, 1972, 47-054696
Int. Cl.² G03B 13/08, 17/20
U.S. Cl. 354—225 5 Claims

1. In a viewfinder for single lens reflex cameras of the type including a focussing screen, an objective lens forming an image of an object on the focussing screen, a pentagonal roof prism having a bottom light entry surface, a roof surface, at least one front reflecting surface and a rear light exit surface, an eyepiece facing the rear light exit surface, an optical element interposed between the rear light exit surface of the pentagonal prism and the eyepiece and having a reflection-transmission surface for directing, toward the eyepiece, light entering the bottom surface of the pentagonal prism from the focussing screen and reflected by the roof surface and the front reflecting surface for projecting through the light exit surface toward the eyepiece, the optical element having a reflecting surface operable to totally reflect, in a direction away from the eyepiece, undesired light entering the bottom surface of the pentagonal prism and internally reflected in the pentagonal prism by the roof surface, the front surface and the bottom surface toward the light exit surface: the improvement comprising, in combination, at least one indication member; and means, including said optical element, forming at least one reflection surface additionally reflecting light from said indication member to said eyepiece.

3,911,458
PROGRAMME-CONTROLLED SHUTTER FOR MINIATURE CAMERAS

Tadayuki Imai, Kawasaki, and Yoshitaka Shiratori, Sohka, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1973, Ser. No. 421,323
Claims priority, application Japan, Dec. 4, 1972, 47-138474
Int. Cl. G03b 7/12
U.S. Cl. 354—230 3 Claims



1. A shutter control mechanism for cameras of the type including:

a. shutter blades;

b. operating means for opening and closing said shutter blades;

c. a depressible release button for actuating said operating means; and

d. an exposure meter having a movable indicator needle; wherein the improvement comprises:

e. a displaceable connecting lever;

f. means for urging said connecting lever toward displacement in one direction;

g. means for holding said connecting lever against displacement by said urging means and for releasing said connecting lever upon the initial depression of said release button;

h. means on said connecting lever for sensing the position of said indicator needle and for stopping the displacement of said connecting lever in accordance therewith;

i. a rotatable cam having an aperture setting cam surface thereon;

j. means for rotating said cam in accordance with the displacement of said connecting lever;

k. a rotatable flywheel;

l. a gear attached to said flywheel for rotation therewith;

m. rotatable means cooperating with said gear for urging said flywheel in rotation in one direction;

n. stop means for holding said flywheel against rotation in said one direction by said rotatable means;

o. drive means for releasably rotating said flywheel in the opposite direction upon the further depression of said release button;

p. shutter speed setting means on said rotatable means for releasing said flywheel from rotation by said drive means;

q. means on said connecting lever for actuating said shutter speed setting means to release said flywheel and permit it to return to said stop means under the urging of said rotatable means;

r. a pivotable lever adjacent said cam surface and operatively connected to said operating means for controlling the opening and closing of said shutter blades;

s. means for urging said pivotable lever toward engagement with said cam surface; and

t. stop means on said flywheel for holding said pivotable lever against engagement with said cam surface and for releasing said pivotable lever upon the rotation of said flywheel in said opposite direction whereby the distance said pivotable lever travels to engage said cam surface upon release determines the shutter aperture and the time of rotation of said flywheel in said opposite direction and return determines the shutter speed.

3,911,459

AUTOMATIC AND MANUAL SETTING MEANS FOR PHOTOGRAPHIC DIAPHRAGMS

Bodo Mielke, Wolfenbuttel, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

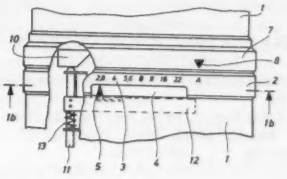
Continuation-in-part of Ser. No. 335,914, Feb. 26, 1973, Pat. No. 3,812,501. This application Apr. 4, 1974, Ser. No. 457,807

Claims priority, application Germany, Apr. 12, 1973, 2318432; Mar. 2, 1972, 2209913

Int. Cl.[2] G03B *9/07, 7/02*

U.S. Cl. 354—273 **7 Claims**

1. A photographic diaphragm having a variable aperture selectively settable either manually or automatically, comprising means forming an aperture scale graduated numerically and having a non-numerical graduation beyond one end of the numerical graduations, automatic aperture setting means including a driving member and a pointer coupled to said driving member to move therewith, said pointer being movable along the numerically graduated portion of said scale, a manual setting ring having an index mark movable along the entire scale upon rotation of said manual setting ring, and means responsive to the position of said manual setting ring for covering and obscuring said pointer when said manual



setting ring is in a position for manual selection of the diaphragm aperture.

3,911,460

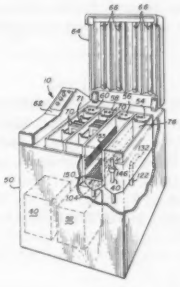
APPARATUS AND METHOD FOR AUTOMATICALLY PROCESSING A BATCH OF PHOTOGRAPHIC ELEMENTS

Daniel J. Lasky, Sunnyvale; Allen T. Puder, Los Altos; Philip Richard Wright, San Jose, and George Oiye, Los Altos, all of Calif., assignors to ILC Technology, Inc., Sunnyvale, Calif.

Filed Aug. 20, 1974, Ser. No. 499,049

Int. Cl.[2] G03D *3/04*

U.S. Cl. 354—328 **14 Claims**



1. Apparatus for simultaneously processing a plurality of emulsion coated photographic plates, comprising:

a processing tank having a bottom wall and side walls, the processing tank being adapted to hold a supply of processing fluid for processing emulsion coated plates when said plates are disposed within the tank in a position to subject the plates to said fluid;

first electrode means disposed within said tank, the first electrode means being positioned within the interior of the tank along a first horizontal plane adjacent to the bottom wall such that when a supply of liquid is held by the tank, the first electrode means rests beneath the surface of said supply of fluid and is substantially parallel to the surface of said fluid;

second electrode means disposed within said tank adjacent the side walls at an elevation above the first electrode means and in a second plane substantially perpendicular to said first plane;

means for receiving and positioning a plurality of said photographic plates in parallel tandem relationship to each other and within said tank above the first electrode means, lateral to the second electrode means with the plane of said plates being substantially normal to the plane of each of said first and second electrodes; and

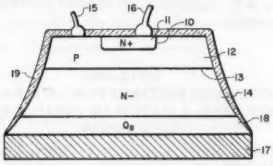
means for applying potential of a first polarity to said first electrode means and a potential of opposite polarity to said second electrode means.

3,911,461

SEMICONDUCTOR DEVICE WITH IMPROVED REVERSE TRANSIENT CAPABILITY

Lowell E. Clark, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Nov. 7, 1974, Ser. No. 521,706
Int. Cl.[2] H01L *29/06, 29/40, 29/72*
U.S. Cl. 357—13 **4 Claims**



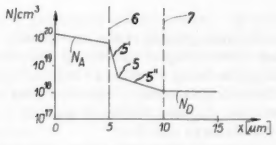
1. A semiconductor device with improved reverse transient capability comprising a first and a second junction between emitter base and collector regions, the collector region being lightly doped to a level of 10^{12} to 10^{13} atoms per square centimeter and a refractory metal contact to said collector thereby providing uniform turn-off power dissipation.

3,911,462

IIIA - VB TYPE LUMINESCENT DIODES

Ehrenfried Butter; Brigitte Jacobs; Klaus Jacobs; Konrad Unger; Alfred Zehe, all of Leipzig; Reiner Doss, and Florian Kugler, both of Teltow, all of Germany, assignors to Jenoptik Jena G.m.b.H., Jena, Germany

Filed Aug. 9, 1972, Ser. No. 282,190
Int. Cl.[2] H01L *33/00, 33/19*
U.S. Cl. 357—17 **2 Claims**



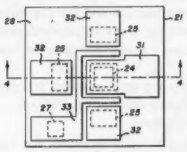
1. A III*a* — *Vb* type semiconductor luminescent diode, possessing highly doped p^+ and n^+ regions and an intermediate p radiative layer, in which the light radiation is emitted in the plane of the PN-junction, characterized in that the electroluminescent diode consists of a basic material which is doped to a donor impurity concentration of N_D 10^{18} atoms/cc and in that the acceptor dopant profile possesses two dopant gradients within the p radiative layer which meet each other, one of the gradients being 10^{22} cm^{-4}, and the other, which lies in vicinity of and intersects the p^+p junction, having a value of 10^{23} cm^{-4}, the entire radiant region exhibits local differences in delay time of 10^{-10} seconds.

3,911,463

PLANAR UNIJUNCTION TRANSISTOR

Clifford O. Hull, Jr., Baldwinsville; Leland F. Leinweber, Dewitt; William H. Sahm, III, Syracuse, and James W. Sprague, Clay, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,055
Int. Cl.[2] H01L *29/08, 29/74*
U.S. Cl. 357—21 **12 Claims**



1. A semiconductor device comprising:
a body of semiconductor material defining two major surfaces, said body exhibiting a first conductivity type;
a base one region formed in said body adjacent one of said major surfaces, said base one region being of the first conductivity type and exhibiting a lower resistivity than the resistivity of the bulk of said body;
a plurality of emitter regions formed in said body adjacent said one major surface, said emitter regions being of a second conductivity type and wherein the spacings between said emitter regions and said base one region are different;
a restraining region formed in said body adjacent said one major surface and contiguous with said base one region and situated between said base one region and said emitter regions, said restraining region being of the second conductivity type and restraining the spreading of said base one region during operation of said semiconductor device; and
wherein a portion of said body comprises a base two region.

3,911,464

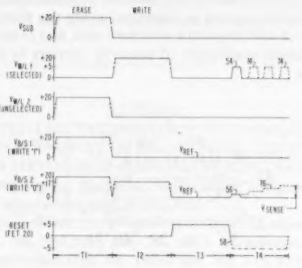
NONVOLATILE SEMICONDUCTOR MEMORY

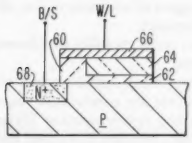
Wen Hsing Chang, Essex Junction, and Hsing-San Lee, Williston, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1973, Ser. No. 364,584
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 **12 Claims**

1. A variable threshold memory device comprising
a semiconductor substrate for one conductivity type, said substrate containing in a first portion thereof only a single region of opposite conductivity type extending from one surface thereof into said substrate;
gate electrode means disposed in field applying reation to a second portion of said substrate adjacent to said first portion of said substrate;
variable threshold means disposed between at least a first portion of said gate electrode means and at least a part of said second portion of said substrate;
means for establishing a first polarized potential across said variable threshold means causing said variable threshold means to assume a low threshold state corresponding to a first logic state and for establishing a second oppositely polarized potential across said variable threshold means causing said variable threshold means to assume a high threshold state corresponding to a second logic state;
means for selectively establishing an electrically floating reference potential on said single region of opposite conductivity type;

read means for applying at least one read potential pulse across said gate electrode means and said substrate, said pulse establishing a surface inversion layer in said second portion of said substrate connected with said region of opposite conductivity type only when said variable threshold means is in a low threshold state, the maximum potential of said read potential pulse being of less magnitude than the potential required to establish a surface inversion layer in said substrate when said variable threshold means is in a high threshold state; and





sensing means for sensing capacitively coupled changes in the floating potential of said single region of opposite conductivity type, a change in said potential being sensed only when said inversion layer has been established.

3,911,465

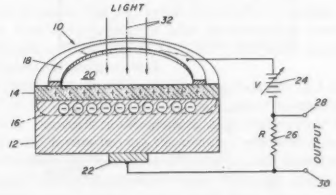
MOS PHOTODIODE

Norman A. Foss, Richmond Hill Road, Weston, Conn. 06880, and Samuel A. Ward, 63 Florence Road, Riverside, Conn. 06878

Division of Ser. No. 384,922, Aug. 2, 1973, which is a continuation of Ser. No. 144,002, May 17, 1971, abandoned. This application Mar. 6, 1974, Ser. No. 448,770

Int. Cl.[2] H01L *27/14, 29/78, 31/00*

U.S. Cl. 357—23 **10 Claims**



1. A photodiode device comprising:

a. a semiconductor body of one conductivity type having a surface region of opposite conductivity type, said surface region constituting an inversion layer which is more highly conductive than said body of semiconductor material;

b. a dielectric film deposited over said region, said film being transparent to light;

c. a single metal electrode disposed on said film, said electrode being sufficiently small in area to leave a substantial portion of said film exposed; and

d. a separate low resistance electrode connection to the opposite surface of said semiconductor body; said photodiode being operative when reverse biased across its electrodes to have a continuous current flow therethrough which represents the degree of illumination, if any, of said dielectric film.

3,911,466

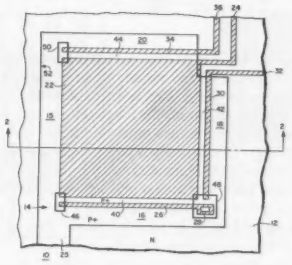
DIGITALLY CONTROLLABLE ENHANCED CAPACITOR

William W. Lattin, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Oct. 29, 1973, Ser. No. 410,678

Int. Cl.[2] H01L *27/04, 29/78, 29/94*

U.S. Cl. 357—23 **7 Claims**



4. An insulated gate field-effect enhanced capacitor including a region of semiconductor material of a first conductivity type having a surface,

a first source region of opposite conductivity type located in said region of said first conductivity type and extending to said surface;

a gate insulator on said surface overlying a portion of said region of said first conductivity type, said portion of said region of said first conductivity type extending to said surface;

at least second and third source regions of said opposite conductivity type in said region of said first conductivity type and extending to said surface, said first, second and third source regions being spaced from each other, said first, second and third source region each contacting said portion of said region of said first conductivity type and being contiguous with said gate insulator;

a first gate electrode overlying said gate insulator and being directly above said portion of said region of said first conductivity type and extending at least to positions overlying portions of the junctions between said portion of said region of said first conductivity type and said first, second and third source regions;

at least second and third gate electrodes overlying said region of said first conductivity type and being separated therefrom by insulator material, said second gate electrode overlying a second portion of said region of said first conductivity type separating said first and second source regions, said third gate electrode overlying a third portion of said region of said first conductivity type separating said first and third source regions, said first and second source regions and said second gate electrode on said insulator material providing a first insulated gate field-effect transistor for coupling said second source region to said first source region, said first and third source regions and said third gate electrode providing a

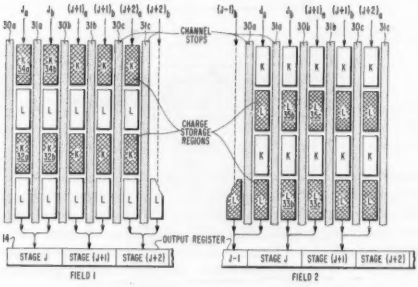
second insulated gate field-effect transistor for coupling said third source region to said first source region;

said first and second insulated gate field-effect transistors providing means for increasing capacitance between said first gate electrode and said first source region by coupling selected ones of said second and third source regions to said first source region by control signals applied to said second and third gate electrodes.

3,911,467
INTERLACED READOUT OF CHARGE STORED IN CHARGE-COUPLED IMAGE SENSING ARRAY

Peter Alan Levine, Kendall Park, and James Edward Carnes, Cranbury, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed July 25, 1974, Ser. No. 491,836
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—24 **10 Claims**



2. A method of horizontally interlacing a vertically interlaced charge pattern of the type in which a first portion of the pattern is shifted out of an image sensing array in the column direction during a first time period to provide one field of a frame and a second portion of the pattern, vertically interlaced with the first, is shifted out of the array in the column direction during a second time period to provide a second field of the frame, comprising the steps of:

during the first time period, combining into a single charge signal, each pair of charge signals present in two adjacent columns, along each row of the array; and

during the second time period, combining into a single charge signal, each pair of charge signals present in two adjacent columns along each row of the array, shifted in the row direction relative to the adjacent regions selected during the first time period, by one column.

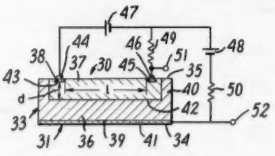
3,911,468
MAGNETIC-TO-ELECTRIC CONVERSION SEMICONDUCTOR DEVICE

Kyoichiro Fujikawa, and Saburo Takamiya, both of Itami, Hyogo, Japan

Continuation-in-part of Ser. No. 144,513, May 18, 1971, abandoned. This application Oct. 16, 1973, Ser. No. 406,807
Claims priority, application Japan, May 22, 1970, 45-43868; June 26, 1970, 45-55803
Int. Cl.[2] H01L *29/82, 27/22*
U.S. Cl. 357—27 **14 Claims**

1. A magnetic-to-electric conversion semiconductor device comprising: at least one transistor structure unit including a collector region of a first semiconductivity type, a base region of a second semiconductivity type inset in said collector region to form a PN junction therebetween, an emitter region disposed on said base region to form a PN junction therebetween for injecting carriers into the base region, a base electrode disposed on said base region in spaced-apart relationship from said emitter region, and a collector electrode disposed on said collector region; and bias means for applying a first bias potential between said emitter region and said base electrode and a second bias potential between said emitter region and said collector electrode to inject carriers from said emitter region into said base region; and wherein said transistor structure unit is configurated in relation to the bias potentials developed by said bias means such that the time quantity d^2/D,

wherein d represents the distance between the emitter and collector regions as measured along the thickness direction of said transistor structure unit, and D represents the diffusion coefficient of minority carriers in the base region



and the time quantity $l^2/\mu V_{EB}$,

wherein l represents the distance between the emitter region and the region of said base region on which said base electrode is disposed,

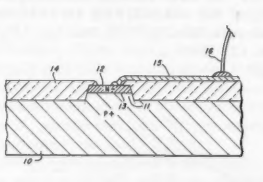
μ represents the carrier mobility of minority carriers in the base region, and

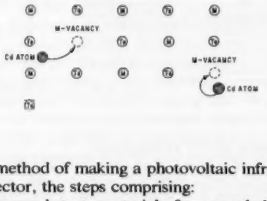
V_{EB} represents the voltage applied across said emitter region and base electrode are substantially equal to each other and less than the recombination lifetime in said base region of carriers injected from said emitter region into said base region so that the flow of carriers through said base region toward said collector region varies in coefficient of transportation in accordance with the direction of an applied magnetic field to accordingly vary the number of carriers that reach said base electrode.

3,911,469
METHOD OF FORMING P-N JUNCTION IN PbSnTe AND PHOTOVOLTAIC INFRARED DETECTOR PROVIDED THEREBY

Joseph S. Wrobel, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 25, 1974, Ser. No. 445,412
Int. Cl. H01l *15/00*
U.S. Cl. 357—30 **9 Claims**





1. In a method of making a photovoltaic infrared radiation diode detector, the steps comprising:

providing a substrate material of unannealed PbSnTe crystal having n-type background impurities and with a crystalline lattice having metal vacancies therein of predomi-

nately Pb so as to be *p*-type conductivity material of high carrier concentration; and

diffusing a defect compensating impurity taken from the class consisting of Cd and Zn into a surface of said PbSnTe material to compensate for the *p*-type stoichiometric defects resulting from the Pb vacancies found therein so that a P-N junction of N^- - P^+ structure is formed by virtue of the *n*-type background impurities becoming dominant in the region of the PbSnTe substrate into which the defect compensating impurity is diffused.

3,911,470
INTEGRATED CIRCUIT FOR LOGIC PURPOSES HAVING TRANSISTORS WITH DIFFERENT BASE THICKNESSES AND METHOD OF MANUFACTURING SAME

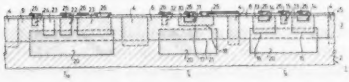
Heinz Walter Ruegg, Hausena, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 198,223, Nov. 12, 1971, abandoned, and Ser. No. 382,543, July 25, 1973, abandoned. This application Oct. 18, 1974, Ser. No. 515,973

Claims priority, application Netherlands, Nov. 14, 1970, 7016710

Int. Cl.² H01L *29/72*

U.S. Cl. 357—36 **7 Claims**



1. An integrated circuit device comprising:

a. a semiconductor substrate of a first conductivity type;

b. a surface layer of a second conductivity type located on said substrate;

c. isolation diffusion zones of said first conductivity type extending from the surface of said surface layer into said substrate, said isolation diffusion zones dividing said surface layer into a plurality of islands;

d. at least one multi-emitter transistor of one type located individually within one of said islands and comprising a collector region and a base region;

e. at least one further transistor of said one type located individually within another one of said islands, said further transistor including a base region electrically connected to said collector region of said multi-emitter transistor, said base region of said multi-emitter transistor significantly exceeding in thickness said base region of said further transistor; and

f. local buried layers of said second conductivity type located in at least said one and said other islands at the interface between said substrate and said surface layer, said buried layers having dimensions within the boundaries of their respective said islands, said multi-emitter and said further transistors being disposed above their respective said buried layers, said base region of said multi-emitter transistor extending from said surface into its associated buried layer to a greater depth than said base region of said further transistor and constituting with its associated buried layer part of the collector junction of said multi-emitter transistor, said base region of said further transistor being spaced from its associated buried layer.

3,911,471
SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING SAME

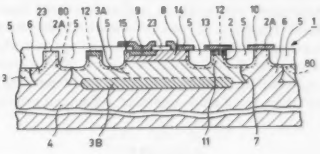
Else Kooi, and Johannes Antonius Andress Van Gils, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1973, Ser. No. 421,526

Claims priority, application Netherlands, Dec. 29, 1972, 7217783

Int. Cl.² H01L *27/04, 21/76, 21/95*

U.S. Cl. 357—50 **12 Claims**



1. A semiconductor device having a semiconductor body with plural isolated semiconductor circuit elements, said body comprising a substrate portion and on the substrate portion a semiconductive layer having a substantially uniform thickness into which the circuit elements are incorporated, said semiconductive layer having a first region of a first type conductivity adjoining its uppermost surface and also adjoining a second region of the substrate portion and of a second, opposite type conductivity forming a generally horizontal P-N junction, and means for laterally isolating from each other island-shaped parts of said first region of said semiconductive layer, said lateral isolation means comprising annular portions of a pattern of an electrically insulating material which is deeply inset in but not through the semiconductive layer and which surround each island-shaped first region part at the surface, each isolated circuit element being present entirely within an island-shaped first region part, and a doped annular isolation zone of the second type conductivity which extends below the inset pattern and down into the second region forming with a first region part a generally vertical P-N junction that terminates on the insulating pattern portion, said doped isolation zone having a portion extending upwardly through the inset pattern above it to a part of the said semiconductive layer which is laterally bounded entirely by a portion of the inset insulating pattern and which is spaced from the layer's uppermost surface a distance much less than the maximum thickness of the insulating pattern, said doped isolation zone having a second type dopant concentration exceeding the first type dopant concentration of the adjacent first region portions.

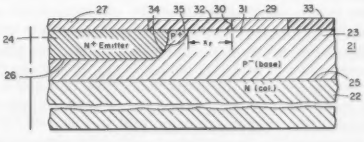
3,911,472
ISOLATED CONTACT

Michael E. Craft, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 138,219, April 28, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 430,459

Int. Cl.² H01L *27/02, 23/48*

U.S. Cl. 357—51 **10 Claims**



1. A transistor, which comprises:

a collector of one conductivity type,

a base region of opposite conductivity type on said collector, said base region having an upper surface opposite to said collector,

a region of enhanced conductivity of the same conductivity type as said base region extending from the upper surface of said base region into said base region to a given depth, having a given area and having a higher doping concentration than said base region,

an emitter region of said one conductivity type contained within and smaller than the area of said enhanced conductivity region but having a greater depth than said enhanced conductivity region so as to extend beneath said enhanced conductivity region into said base region and leave a portion of said enhanced conductivity region surrounding said emitter reigon at said upper surface, and ohmic contact metallization over each of said emitter and base regions, the ohmic contact for said base region being spaced apart from said region of enhanced conductivity.

3,911,473

IMPROVED SURFACE BREAKDOWN PROTECTION FOR SEMICONDUCTOR DEVICES

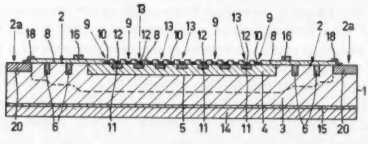
Rijkent Jan Nienhuis, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 165,691, July 23, 1971. This application Aug. 14, 1972, Ser. No. 280,421

Claims priority, application Netherlands, Oct. 12, 1968, 6814636

Int. Cl.² H01L *29/34, 29/40*

U.S. Cl. 357—52 **1 Claim**



1. A semiconductor device having a semiconductor body comprising a first region of one conductivity type adjoining a substantially flat surface of the semiconductor body, a second region of opposite conductivity type adjoining said surface and being entirely surrounded by the first region within the semiconductor body to form a first p-n junction between the first and the second regions, said first p-n junction terminating at said surface, at least one further region of said opposite conductivity type being situated beside the second region, adjoining said surface, and being entirely surrounded by the first region within the semiconductor body to form a second p-n junction between the first region and the further region, said p-n junction terminating at said surface, said further region surrounding the second region, an insulating layer on said surface, said insulating layer having a contact window at which there is provided an electrical contact for the second region, a conductive layer disposed on the insulating layer, said conductive layer substantially surrounding the second region, the distance from said electrical contact along a line measured parallel to the insulating layer to the further region exceeding the distance along the line to the conductive layer, and means to connect the conductive layer to a surface part of the first region which is free from the insulating layer and is beyond the further region with respect to the contact layer, so that said conductive layer conducts to said first region charges originating at said electrical contact, said device further comprising a second further region of said opposite conductivity type that is situated beside the first further region, said second further region adjoining said surface and being entirely surrounded by the first region within the semiconductor body to form a third p-n junction between the first region and the second further region, said third p-n junction terminating at said surface, said second further region surrounding the first further region, a second conductive layer on the insulating layer which substantially surrounds the second further region, and means to connect the first conductive layer to the second conductive layer, said connection means comprising a third conductive layer on the insulating layer at most partly covering the surface of the insulating layer laying above said between the first and the second further regions.

3,911,474

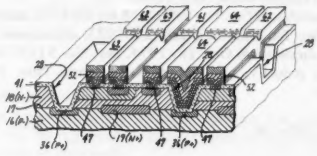
SEMICONDUCTOR STRUCTURE AND METHOD

Warren C. Rosvold, Sunnyvale, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 214,589, Jan. 3, 1972, abandoned. This application July 30, 1973, Ser. No. 381,040

Int. Cl.² H01L *23/48, 29/46*

U.S. Cl. 357—71 **7 Claims**



1. In a semiconductor structure, a semiconductor body having a planar surface and having regions of first and second conductivity types extending to said surface, a layer of insulating material formed on said surface, said layer having openings therein exposing portions of said regions, a lead structure adherent to said layer of insulating material and extending through said openings to make contact to said portions of said regions so that said regions form parts of an integrated circuit, said lead structure including a first layer of gold having a relatively rough surface with a roughness scale ranging from 10 to 20 microinches so that photoresist will readily adhere thereto, and a layer of photoresist adherent to said relatively rough surface of said gold layer.

3,911,475

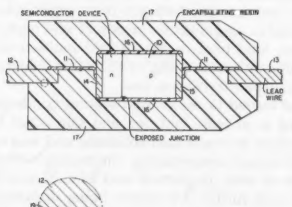
ENCAPSULATED SOLID STATE ELECTRONIC DEVICES HAVING A SEALED LEAD-ENCAPSULANT INTERFACE

John R. Szedon, Eight-Four, Pa.; John A. Jackson, Tempe, Ariz., and David C. Phillips, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 245,416, April 19, 1972, Pat. No. 3,821,099. This application Mar. 4, 1974, Ser. No. 447,617

Int. Cl.² H01L *23/28*

U.S. Cl. 357—72 **10 Claims**



1. A solid state electronic device, metallic electrical connection leads attached to said device and a rigid encapsulant comprising a plastic material encapsulating said device and leads; wherein the leads have an electrocoated, continuous,

pinhole free, smooth, flexible, cured resinous moisture barrier film, consisting of an organic layer of polyimide resin, coating its surface, which film is intimately bonded to the leads and plastic encapsulant, providing a void-free moisture resistant lead-encapsulant interface.

3,911,476

COLOR PICTURE/SOUND RECORD

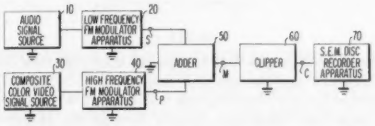
Eugene Orville Keizer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 11, 1974, Ser. No. 441,069

Claims priority, application United Kingdom, Mar. 20, 1973, 13234/73

Int. Cl. H04n *9/02*

U.S. Cl. 358—4 **4 Claims**



1. A color picture/sound record comprising:

a disc having a spiral groove in a surface thereof, said groove containing an information track comprising variations in the geometry of the groove bottom along a plurality of convolutions of said spiral groove;

said groove bottom geometry variations comprising alternations between a first cross-sectional shape for the groove in which the groove bottom and adjacent groove walls define a continuous smooth curve, and a second cross-sectional shape in which the groove bottom is depressed relative to the groove bottom level associated with the first cross-sectional shape;

wherein the rate of recurrence of the groove bottom depressions varies along a groove convolution in accordance with the recorded picture information inclusive of luminance and chrominance components;

wherein the ratio of the groove length of a depressed groove bottom region to the groove length of the succeeding non-depressed groove bottom region varies along a groove convolution in cyclical fashion; and

wherein the frequency of the cyclical ratio variation varies in accordance with the recorded sound information.

3,911,477

COLOR VIDEO TAPE RECORDER UTILIZING A COLOR SUBCARRIER OSCILLATOR AS AN ERASING SIGNAL

Robert Lackner, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

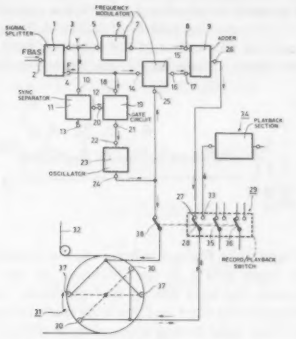
Filed Nov. 21, 1973, Ser. No. 418,078

Claims priority, application Austria, Dec. 28, 1972, 11105/72

Int. Cl.² H04N *5/785*

U.S. Cl. 358—4 **2 Claims**

1. Recording and/or playback apparatus for color video signals of the type having a rotating head assembly which scans tracks on a record carrier and comprises at least one record and/or playback head, at least one erase head for trackwise erasing a recorded video signal, the improvement wherein an oscillator synchronized with the color synchronizing signal of the color video signal is provided for generating



a color subcarrier and is selectively connected to the erase head to supply the latter.

3,911,478

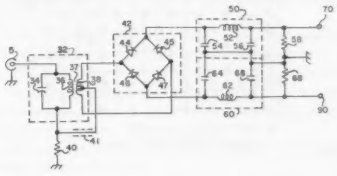
METHOD AND APPARATUS FOR PROCESSING TEST SIGNALS WHICH CONVEY INFORMATION AS TO GAIN AND DELAY DISTORTIONS OF T.V. SYSTEMS

Charles W. Rhodes, Beaverton, Oreg., assignor to Tektronix Inc., Beaverton, Oreg.

Filed Apr. 5, 1972, Ser. No. 241,118

Int. Cl.² H04N *9/62*

U.S. Cl. 358—10 **21 Claims**



1. The method of processing a modulated sinesquared test signal, comprising:

separating said modulated sine-squared test signal into a low-frequency component and a high frequency component;

splitting the high-frequency component into a first signal having a positive polarity and a second signal having a negative polarity;

detecting the positive envelope of said first signal and the negative envelope of said second signal; and

adding the separated said low-frequency component linearly to each such positive and negative envelopes of said first and second signals recovered from detection of said high-frequency component to form two measurement waveforms.

3,911,479

COLOR SELECTIVE LOW PASS FILTER

Toshio Sakurai, Ohmiya, Japan, assignor to Fuji Shashin Koki Kabushiki Kaisha, Ohmiya, Japan

Filed June 21, 1973, Ser. No. 372,275

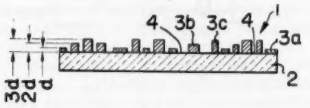
Claims priority, application Japan, June 23, 1972, 47-63055

Int. Cl.² H04N *9/06*

U.S. Cl. 358—44 **4 Claims**

1. An optical low-pass filter in a taking lens system of a single-tube color television camera comprising a transparent

substrate, and a plurality of transparent striped filter layers deposited on said substrate in parallel to one another and extending orthogonally to the direction of scanning of the electron beam in the television camera, the optical path difference $(n-1)d$ caused by said filter layers in the light incident orthogonally to the surface of the substrate being an integral number of times as large as the particular wavelength of the



color of light to be filtered, where n is the refractive index of the filter layer and d is the thickness of the filter layer, whereby only the light having said particular wavelength is passed through the filter and the high spatial frequency components of the light having a wavelength different from said particular wavelength are eliminated by said filter by color-selective filtration.

3,911,480

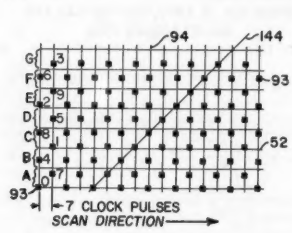
GENERATING SCREENED HALF-TONES BY SCANNING

John P. Brucker, 6178 Tamilynn St., San Diego, Calif. 92122

Continuation-in-part of Ser. No. 313,585, Dec. 8, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 435,334

Int. Cl.[2] **H04N** *1/46*

U.S. Cl. 358—75 **26 Claims**



2. A scanning apparatus for producing half-tone images with screen axes rotated at some fixed angle from the direction of scanning comprising:

means for generating individual dot characters on an image receiving sheet in various sizes corresponding to various density levels;

means for deflecting said dot characters in increments along a linear path rotated at some specific angle that is within 2° of 45° from the rotated axis of said half-tone screen; and

means for controlling the increments of deflection and the timing of the formation of said dot characters.

3,911,481

VISUAL AND MAGNETIC RECORDING SYSTEMS

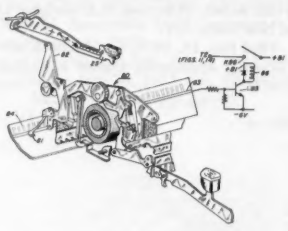
Joseph R. Andreaggi, Short Hills; Robert J. Graf, Newark, and Matthew J. Relis, Teaneck, all of N.J., assignors to Joseph R. Andreaggi, Short Hills, N.J.

Division of Ser. No. 250,872, May 8, 1972, Pat. No. 3,823,405. This application Dec. 28, 1973, Ser. No. 429,206

Int. Cl. G11b *5/08*

U.S. Cl. 360—4 **7 Claims**

1. The combination of a typewriter apparatus having a plurality of typewriter keys and a magnetic recording system for recording magnetic bits on a magnetizable medium mounted on the typewriter platen, the recording system comprising a plurality of stages for producing high-ampereage currents, the flow directions of certain currents being different and coded to represent different ones of the typewriter keys, each of said stages including a first and a second control device having at least one control electrode, an output electrode and a third electrode, first and second capacitors under the control of said devices, the first capacitor coupling the output electrode of said second device to the third electrode of said first device and the second capacitor coupling the output electrode of said first device to the third electrode of said second device, means for charging said capacitors prior



to actuation of a typewriter key, means coupled to the control electrodes of said devices and responsive to actuation of a typewriter key for activating one said devices, whereby one of said capacitors discharges current through the output electrode of the one device, and a conductor associated with each of said stages mounted adjacent said platen and said medium and connected to the one output electrode for inducing a magnetic flux in said magnetic medium of polarity determined by the direction of current flow in said conductor.

3,911,482

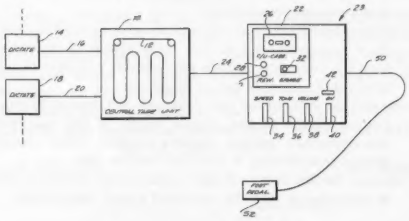
DUAL MEDIA TRANSCRIBING APPARATUS

Alfred E. Kolb, Dielsdorf, and Willy Nyffenegger, Unterehrendingen, both of Switzerland, assignors to Dictaphone Corporation, Rye, N.Y.

Filed Mar. 12, 1974, Ser. No. 450,402

Int. Cl.[2] **G11B** *5/86, 27/02*

U.S. Cl. 360—15 **15 Claims**



1. Dual media transcribing apparatus for controlling the reproduction and transcription of information which previously had been recorded on different magnetic media, comprising:

a central record/reproduce device having an endless loop of bidirectionally movable magnetic tape upon which signals derived from at least one remote dictating station are recorded;

a magnetic reproducing device having a cassette-type structure within which is housed magnetic tape upon which signals are recorded, said magnetic tape being movable in a forward direction at first and second speeds and movable in a reverse direction;

operator actuable control switch means for selectively controlling the direction and speed of movement of magnetic tape upon the manual operation thereof;

a set of device selection switches having first and second states, said device selection switches selectively coupling said operator actuable control switch means to said central record/reproduce device and to said magnetic reproducing device for enabling said control switch means to control the movement of said endless loop of magnetic tape when said selection switches exhibit said first state and for enabling said control switch means to control the movement of said magnetic tape housed within said cassette-type structure when said selection switches exhibit said second state;

audio signal processing means coupled to said device selection switches for receiving the audio signals reproduced by said central record/reproduce device and said magnetic reproducing device in accordance with the state exhibited by said device selection switches; and

transducing means coupled to said audio signal processing means for generating audible signals corresponding to the audio signals received by said audio signal processing means.

3,911,483

APPARATUS AND METHOD FOR RECORDING AND REPRODUCING A VIDEO SIGNAL IN SUCCESSIVE RECORD TRACKS ON A RECORD SHEET WITHOUT GUARD BANDS BETWEEN ADJACENT TRACKS

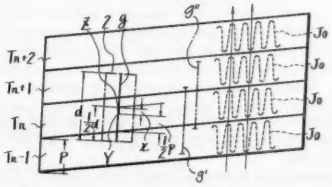
Nobutoshi Kihara, and Yukihiko Machida, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 18, 1973, Ser. No. 425,845

Claims priority, application Japan, Dec. 23, 1972, 48-621

Int. Cl.[2] H04H *5/78*; **G11B** *5/22, 21/10*

U.S. Cl. 360—33 **44 Claims**



1. An apparatus for recording and reproducing video signals having synchronizing signals denoting line and field intervals of said video signals, comprising a record medium, signal recording means arranged adjacent said record medium and receiving the video signals for recording on said record medium, said record medium and signal recording means being moved relative to each other so that the video signals are recorded on said record medium in successive record tracks which extend parallel to each other and have abutting longitudinal margins with said synchronizing signals of the video signals recorded in adjacent record tracks being aligned with each other in the direction at right angles to the length of said tracks, and at least one signal reproducing head moved relative to said record medium for scanning said record tracks in succession, said signal reproducing head having an effective width substantially greater than the width of each of said record tracks so as to simultaneously scan, and reproduce signals from, the full width of one of said record tracks and a portion of the width of at least one of the record tracks adjacent thereto.

3,911,484

OPERATION CONTROL DEVICE FOR MULTICHANNEL MEMORY APPARATUS

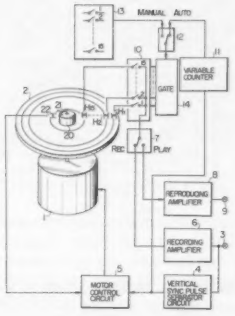
Katsuhisa Mutou, and Tsunehiko Teshima, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 6, 1973, Ser. No. 422,338

Claims priority, application Japan, Dec. 8, 1972, 47-122534

Int. Cl.[2] G11B *15/12*; **H04H** *5/78*

U.S. Cl. 360—35 **8 Claims**



1. An operation control device for a multichannel memory apparatus comprising:

vertical synchronizing pulse separater means for separating vertical synchronizing pulses from a video signal;

counter means connected to the vertical synchronizing pulse separater means for generating specified pulses whose repetition rate is lower than that of the vertical synchronizing pulses;

a rotatable magnetic member having a plurality of magnetic recording channel tracks;

a plurality of channel heads each assigned to a respective one of the plurality of channel tracks of said rotatable magnetic member;

a recording-reproducing change-over switch having a movable contact and two stationary contacts, one of the stationary contacts being connected to a recording stage and the other of the stationary contacts being connected to a reproducing stage;

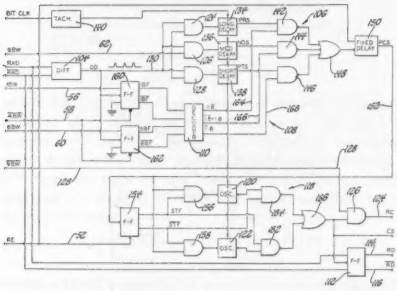
head transfer means having a plurality of electrical transmission paths connected between a respective one of said channel heads and the movable contact of the recording-reproducing change-over switch, for controlling the conduction of the plurality of the electrical transmission paths one after another; and

auto-manual change-over switching means including an auto-operation switch means and a manual-operation switch means which are alternatively rendered operable, said auto-operation switch means, when rendered operable, transmitting therethrough pulses in accordance the specified pulses from the counter means to the head transfer means so that the conduction of the plurality of the electrical transmission paths is controlled in sequence by the pulses, and said manual-operation switch means having a plurality of manually conducting unit switch means each assigned to a respective one of the electrical transmission paths so that when one of the unit switch means is rendered operable while the manual-operation switch means is operable, the corresponding electrical transmission path is rendered conductive.

3,911,485
SELF-CLOCKING NRZ RECORDING AND REPRODUCTION SYSTEM

Ronald P. McGrath, Livonia, and William A. Bleher, Detroit, both of Mich., assignors to General Instrument Corporation, Hawthorne, Calif.

Division of Ser. No. 235,583, March 17, 1972, Pat. No. 3,852,810. This application Aug. 9, 1974, Ser. No. 495,995
Int. Cl.[2] G11B *5/02*
U.S. Cl. 360—45 **2 Claims**

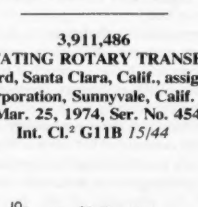


1. In a magnetic data storage system of the type having a magnetic storage medium wherein data is stored in the form of flux defining data cells and a sync flux level transition occurs every *n* data cells; read means responsive to the flux transitions in the magnetic storage medium to produce a corresponding signal waveform, timing means including an oscillator responsive to the occurrence of the sync transition to produce a timing signal sequence for determining the timing for reading said signal waveform, first compensation means connected between said read means and said timing means for effectively delaying the start of said timing signal sequence when the data cell preceding the sync transition does not contain a transition and the data cell following the sync transition does contain a transition, and second compensation means connected between said read means and said timing means for effectively advancing the start of said timing signal sequence when the data cell preceding the sync transition does contain a transition and the data cell following the sync transition does not contain a transition.

3,911,486
COMMUTATING ROTARY TRANSFORMER

Earl Roger Hibbard, Santa Clara, Calif., assignor to American Videonetics Corporation, Sunnyvale, Calif.

Filed Mar. 25, 1974, Ser. No. 454,257
Int. Cl.[2] G11B *15/44*
U.S. Cl. 360—64 **8 Claims**

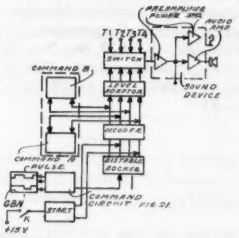


1. A commutating rotary transformer for successively coupling signals to or from a plurality of rotating transducer heads in a tape recorder, said transformer comprising: a primary section constrained for rotation about an axis with the transducer heads, said primary section having a plurality of radially extending magnetic core segments and an arcuately disposed primary winding on each of the core segments, each primary winding being connected to a different one of the transducer heads, and a stationary secondary section comprising a radially extending magnetic core segment and an arcuately disposed winding on the core segment, the secondary section being disposed coaxially of the primary section and spaced axially therefrom with the secondary core segment in close proximity to the primary core segments and positioned to be aligned successively with different ones of the primary segments as the primary section rotates, whereby different ones of the rotating transducer heads are successively coupled to the stationary secondary winding.

3,911,487
MAGNETIC TAPE PLAYBACK UNIT WHICH SEQUENTIALLY SWITCHES BETWEEN FOUR TRACKS BY DETECTING END OF TRACK SILENCE

Serge Ladriere, 2, rue des Pavillons, 92000 Nanterre, France

Filed Feb. 23, 1973, Ser. No. 335,046
Claims priority, application France, Apr. 19, 1972, 72.13733; Nov. 24, 1972, 72.41795
Int. Cl.[2] G11B *15/12, 15/48, 21/08*
U.S. Cl. 360—63 **8 Claims**



1. Apparatus for reproducing recordings from a tape having at least four tracks and mounted for movement in a case comprising:

a plurality of magnetic heads each mounted for detecting signals from one of said tracks,

means for moving said tape past said heads,

means for receiving a signal from one of said heads and producing an audio output,

electronic switch means for coupling any one of said heads to said receiving and producing means and

means for controlling said switch means to cause each of said heads to be sequentially coupled one at a time to said receiving and producing means to play each of said four tracks and reverse the direction of tape movement after each track has been played including means connected to said receiving and producing means for producing a trigger signal when silence continues for greater than a predetermined length of time, means connected to said trigger signal producing means for reversing the direction of tape movement whenever said trigger signal is produced, means connected to said trigger signal producing means and responsive to said trigger signal for preventing a further trigger signal for a predetermined time after a trigger signal is produced, at least two multivibrators providing four output states each associated with one of said tracks and responsive to said trigger signal to change its output state, the output state determining which of said heads is coupled to said receiving and producing means.

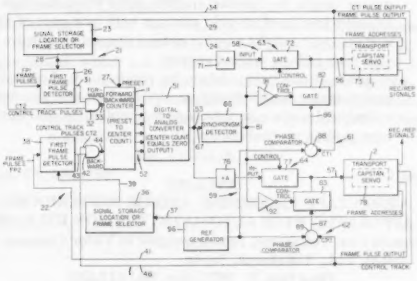
3,911,488
METHOD AND APPARATUS FOR SYNCHRONIZING RECORD/REPRODUCE TRANSPORTS

Tracy G. Wood, San Jose, and Erik O. J. Salbu, Los Altos, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 290,428, Sept. 19, 1972, abandoned, which is a continuation of Ser. No. 79,815, Oct. 12, 1970, abandoned. This application Apr. 24, 1974, Ser. No. 463,474

Int. Cl.[2] G11B *15/52, 15/26, 15/44, 19/24*

U.S. Cl. 360—71 **11 Claims**



1. In a method of controlling the drives of a pair of transports each for moving a storage medium carrying recorded storage location signals and each having control signals associated therewith from which the rate at which its storage medium is moved can be determined wherein the transports are operated to provide the associated control signals and to reproduce the storage location signals for synchronizing the record/reproduce rates of the transports while the storage media are relatively positioned to align selected storage locations thereof, the steps comprising:

establishing a reference indicative of the synchronized record/reproduce rates of the transports with the selected storage locations aligned;

comparing to said established reference the control signals provided by one of the transports in response to the reproduction of storage location signals of the storage medium moved thereby;

comparing to said established reference the control signals provided by the other transport in response to the reproduction of storage location signals of the storage medium moved thereby;

generating a representation of the record/reproduce rates of the transports and alignment of the storage locations in response to said comparisons;

commanding the transports simultaneously in response to said generated representation to cause both to move their respective storage media in accordance with said generated representation; and

adjusting the commanding of the transports simultaneously in opposite phase senses when said generated representation indicates a lack of synchronization of the record/reproduce rates of the transports and alignment of selected storage locations to cause one of the transports to move its storage medium at a rate greater than the synchronized rate and the other to move its storage medium at a rate less than the synchronized rate.

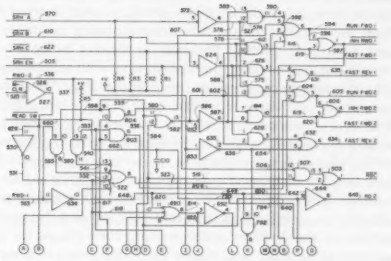
3,911,489
SEARCH FEATURE FOR AN AUTOMATED TYPING SYSTEM

Gary W. Spence, Loretto; James L. Wienhold, and Larry E. Kveberg, both of Minneapolis, all of Minn., assignors to CPT Corporation, Hopkins, Minn.

Filed Dec. 26, 1973, Ser. No. 427,925

Int. Cl. G11b *15/18*

U.S. Cl. 360—72 **14 Claims**



1. In an automated typing system of the type having

information storage means for storing information to be typed comprising magnetic tape and tape drive means;

recording means for recording information on the information storage means; and

typing means for reproducing all or selected portions of the information stored on the information storage means;

the improvement comprising

means for registering address numbers of one or more digits to be recorded on the information storage means which designate the specific location of information to be typed by the typing means from the information storage means; and

means for converting each address number contained in the registering means to a plurality of pulses to be recorded by the recording means on the information storage means which are at least a multiple of the corresponding address number whereby when the pulses are recorded on the tape by the recording means the converted address numbers are readable in either direction of tape drive and extraneous noise pulses do not provide a false indication of recorded information.

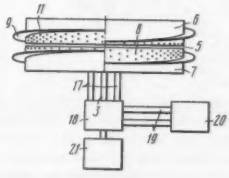
3,911,490
HEAD DRUM STRUCTURE FOR VIDEO TAPE RECORDER

Boris Mikhailovich Kostin, prospekt Dzer.hinskogo, 12, kv. 6; Boris Grigorievich Lapin, ulitsa Industrialnaya, 4, kv. 57; Vladimir Alexandrovich Saburov, ulitsa 1 Shkolnaya, 30, kv. 47; Vladimir Iosifovich Sheikhetov, ulitsa D. Bednogo, 64, kv. 13, and Sergei Ivanovich Suvorov, ulitsa Vokzalnaya Magistral, 1, kv. 103, all of Novosibirsk, U.S.S.R.

Filed Dec. 10, 1973, Ser. No. 423,529

Int. Cl.[2] G11B *21/04, 5/10, 15/62;* **H04N** *5/78*

U.S. Cl. 360—84 **5 Claims**



1. An oblique line-recording video tape recorder comprising a supply reel to supply a tape video-information carrier, a

take-up reel to store said tape, a stationary cylindrical drum positioned intermediate said supply and take-up reels, helical guide projections being provided on the surface of said drum defining therebetween a helical path for said tape about the circumference of said drum, a circumferential slot in said drum within the said defined path, a plurality of perforations formed in said drum within said defined path, a rotatable shaft coaxially mounted within said drum, at least one video magnetic-head carried by said shaft for rotation therewith within said circumferential slot and projecting beyond the exterior circumferential surface of the drum, a rotor carried by said shaft for rotation therewith, said rotor being rotatable within said drum and dividing the interior thereof at least over the peripheral area of the drum coextensive with said defined path into at least one overpressure zone and at least one underpressure zone, said video magnetic-head being maintained within said underpressure zone, means for supplying pressurized gas to said overpressure zone and means for reducing the pressure within said underpressure zone, an air bearing support for said tape being thus formed over the circumferential extent of said overpressure zone and a predetermined suction pressure adapted to aspirate said tape into contact with the underlying surface of the drum in underpressure zone means for rotating said rotatable shaft, and means for withdrawing said tape from said supply reel for recording of the information thereon by said video magnetic-head and for winding upon said take-up reel at a predetermined rate, whereby rotation of said shaft and rotor effectuates the development of said air bearing which rotates together with the underlying overpressure zone while said video magnetic-head comes into contact with only the section of the tape aspirated against the surface of the drum by the suction pressure within said underpressure zone.

3,911,491

AUTOMATIC TAPE LOADING RECORDING-REPRODUCING APPARATUS OF DRUM ROTATION TYPE

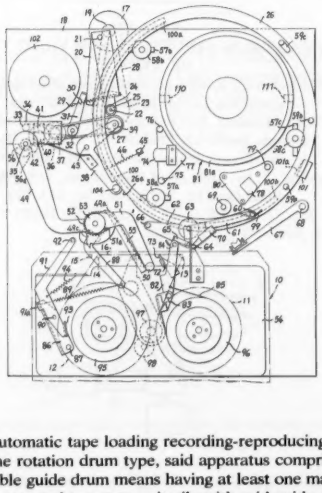
Yoshikazu Terao, Tokyo, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 19, 1973, Ser. No. 352,415

Claims priority, application Japan, Apr. 21, 1972, 47-47285[U]

Int. Cl.[2] G11B *15/66*

U.S. Cl. 360—85 **8 Claims**



1. An automatic tape loading recording-reproducing apparatus of the rotation drum type, said apparatus comprising:

a rotatable guide drum means having at least one magnetic head mounted to rotate unitarily with said guide drum;

power driving means for positively driving said guide drum at a predetermined rotational speed;

means for drawing a magnetic tape out of a tape cassette when placed in the apparatus;

means for moving said tape drawing out means to a predetermined position;

tape pulling around means for intercepting the tape thus drawn out and for pulling the tape around the cylindrical surface of said guide drum and thereby load said tape in a conformable contact with the surface of said drum with a wrap around a specific angular extent of said drum;

driving means responsive to the arrival of said tape drawing out means at the predetermined position for stopping said moving means and driving said tape pulling around means; and

means for starting the operation of said power driving means at a time between the time when said driving means begins to operate and the time when the tape is brought into conformable contact with one part of said surface over a slight angular extend thereof responsive to said tape pulling around means;

said guide drum being driven in rotation by the driving power means and forming an air film between the drum cylindrical surface and the tape thus pulled around by the tape pulling around means.

3,911,492

VIDEO TAPE RECORDING AND/OR REPRODUCING APPARATUS WITH AUTOMATIC TENSION RELEASE

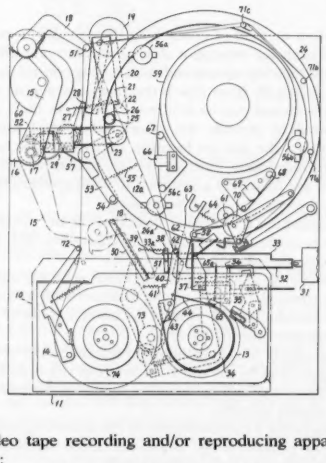
Junichi Ura, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Nov. 5, 1973, Ser. No. 412,681

Claims priority, application Japan, Nov. 7, 1972, 47-110723

Int. Cl. G11b *5/008;* **G03b** *1/04*

U.S. Cl. 360—85 **6 Claims**



1. A video tape recording and/or reproducing apparatus comprising:

a rotating cylindrical drum containing at least one transducer head, a tape recording medium wrapped around a predetermined angular section of the cylindrical surface of said drum;

means including a motor for driving said rotating drum to rotate in one direction and at a specific speed;

means for paying said tape recording medium from one reel, to wrap around said rotating drum section, and thereafter to be taken up on another reel;

braking means for imparting a braking action to a reel disc on which one of said reels is mounted, said one reel being a load on the rotating drum when the rotational direction

is that occurring during the recording and/or reproducing mode; and

brake releasing means operating responsive to an interruption of the power supply to the motor during the recording and/or reproducing mode to remove the braking action of said braking means with respect to the reel disc, the reel disc being thus released from the braking action to prevent imparting excessive tape tension to the rotating drum turning under its inertia after the interruption of power supply to the motor.

3,911,493

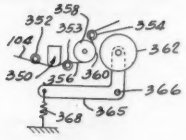
FLUTTER REDUCING TAPE DRIVE MECHANISM, PARTICULARLY FOR VIDEO READING DEVICES

Marvin Camras, Glencoe, Ill., assignor to Illinois Institute of Technology, Chicago, Ill.

Continuation of Ser. No. 393,908, Sept. 4, 1973, abandoned, and a continuation of Ser. No. 241,076, April 4, 1972, abandoned, which is a division of Ser. No. 30,564, April 21, 1970, Pat. No. 3,761,644, which is a division of Ser. No. 528,934, Feb. 21, 1966, abandoned, which is a continuation of Ser. No. 62,601, Aug. 10, 1970, Pat. No. 3,683,707. This application Aug. 12, 1974, Ser. No. 496,868

Int. Cl. G11b *15/00*

U.S. Cl. 360—90 **1 Claim**



1. A tape drive arrangement for use in a video transducer system comprising a transducer head adapted to be normally aligned on a transverse axis extending at right angles to the direction of movement of a tape recording medium, operative to scan the latter, a rotatable capstan spaced from said transducer head and receiving said tape record medium about a portion of the periphery thereof, means defining a record medium path between the transducer head and the capstan including a first tape path portion approaching the capstan from the head which extends in a first general direction at the region where the record medium approaches contact with the capstan, means defining a second tape path portion which extends in a second general direction at the region where the record medium leaves contact with the capstan, the intermediate portion between said first and second path portions conforming to the periphery of said capstan for at least 90° of the circumference thereof, a capstan pressure roller disposed opposite said capstan at said intermediate record medium portion, the axes of said capstan and pressure roller extending parallel to one another with the common plane thereof extending substantially parallel to said first tape path, and means for urging said capstan pressure roller substantially in said plane and toward said capstan with sufficient force to prevent any substantial movement of said capstan in said plane, whereby any flutter of said capstan due to transverse slack or play thereof will only be in directions approximately 90° transverse to said plane and thus to said first tape path portion, having no material effect upon the movement of tape across said head.

3,911,494

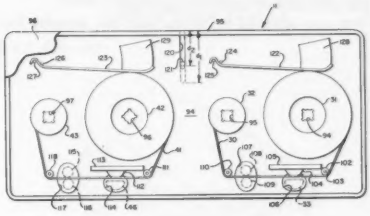
INTERACTIVE TEACHING SYSTEM USING TWO TAPES IN A SINGLE CASSETTE

Stewart W. Wilson, Concord, and John W. Ericson, Marblehead, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 294,475, Oct. 2, 1972. This application Feb. 11, 1974, Ser. No. 441,632

Int. Cl.² G11B *23/04, 15/18, 23/16*

U.S. Cl. 360—92 **6 Claims**



1. A tape cassette for use in an interactive communication system, comprising a housing, first and second strips of recording tape disposed in said housing, means mounting each of said strips in said housing for movement back and forth over a different path for each strip adjacent a different playback station at a predetermined location on each path, one of said strips having a lecture recorded thereon, and the other of said strips having a series of answers to questions that may be raised by the lecture recorded in a spaced series of locations along its length.

3,911,495

CASSETTE TAPE PLAYER START-UP MECHANISM

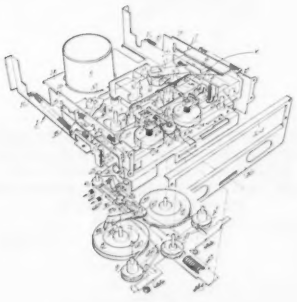
Yoshio Maruyama, and Akihiro Fushimi, both of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed June 13, 1973, Ser. No. 369,645

Claims priority, application Japan, June 15, 1972, 47-59857

Int. Cl.² G11B *15/24*

U.S. Cl. 360—96 **5 Claims**



1. A start-up mechanism for a cassette tape player having a holder mechanism for holding a tape cassette in a predetermined play position, a magnetic head, and a motor for feeding tape in a tape cassette held by said holder mechanism, said start-up mechanism comprising:

1. a capstan;
2. means connecting said motor to said capstan for driving said capstan in rotation;

3. a fly-wheel connected to said capstan and adapted to be rotated therewith;
4. a projection provided on said fly-wheel;
5. a carriage movable in said cassette tape player between a first carriage position in which said magnetic head is close to the tape in a tape cassette positioned in the play position and a second carriage position in which said magnetic head is spaced from the tape in a tape cassette positioned in the play position;
6. means for biasing said carriage towards the first carriage position;
7. a pin provided on said carriage; and
8. a first cam adapted to engage said pin, thereby forcing said carriage from its first to its second position, said first cam having an abutting face located in the path of said pin when said carriage is moved between its first and second position and an engaging portion which may be moved into the path of said projection, said engaging portion being shaped so that when it is pushed out of the path of said projection by the rotational motion thereof, the abutting face of said first cam is caused to move out of the path of said pin,

whereby said carriage may be moved from its second carriage position to its first carriage position solely by the rotational power of said fly-wheel, which rotational power acts on said carriage via said projection, said first cam, and said pin.

DESIGNS

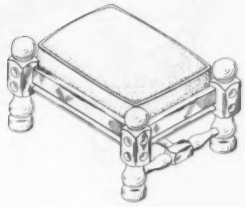
OCTOBER 7, 1975

237,022
BARBER'S APRON
Nathaniel Mathis, 4014 Vine St., Bradbury Heights, Md. 20027
Filed Mar. 8, 1973, Ser. No. 337,861
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—229

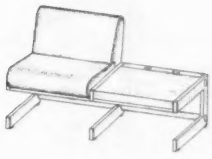
237,023
HIGH CHAIR
Joseph V. Rossi, Chicago, Ill., assignor to Comfort Lines, Inc., Chicago, Ill.
Filed Mar. 27, 1974, Ser. No. 455,119
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—8

237,024
CHAIR OR SIMILAR ARTICLE
Karl Dittert, Schwabisch Gmund, Germany, assignor to Giroflex-Entwicklungs AG, Koblenz, Switzerland
Filed June 18, 1973, Ser. No. 371,293
Claims priority, application Switzerland Feb. 23, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

237,025
FOOTSTOOL
Philip L. Null, Maiden, N.C., assignor to Null, Incorporated
Filed May 8, 1974, Ser. No. 468,259
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36

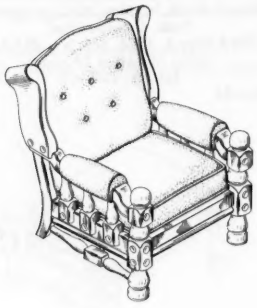


237,026
COMBINED CHAIR AND TABLE UNIT
Franz Vogt, Pohlheim, Germany, assignor to Voko Franz Vogt & Co., Pohlheim, Germany
Filed Feb. 19, 1974, Ser. No. 443,835
Claims priority, application Germany Aug. 17, 1973
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—42

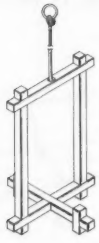


237,027
CHAIR
Charles Bernard, Montreuil-sous-Bois, France, assignor to Airborne S.A., Montreuil-sous-Bois, France
Filed June 11, 1973, Ser. No. 369,020
Claims priority, application France Apr. 10, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

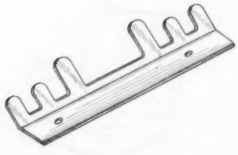
237,028
SEAT
Philip L. Null, Maiden, N.C., assignor to Null, Incorporated
Filed May 8, 1974, Ser. No. 468,015
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—68



237,029
FLOWERPOT HOLDER
Ronald C. Gempel, 1246 Folsom St., San Francisco, Calif. 94114
Filed Oct. 15, 1973, Ser. No. 406,599
Term of patent 7 years
Int. Cl. D11—*02*
U.S. Cl. D6—113

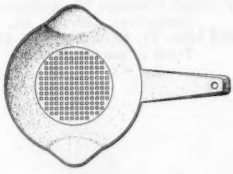


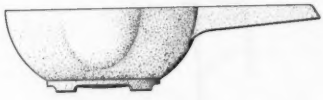
237,030
CLIPPER AND SCISSOR HOLDER
Sam Kohl, 248 E. 34th St., New York, N.Y. 10016
Filed July 19, 1974, Ser. No. 490,195
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—114



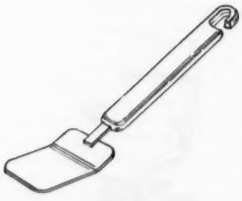
237,031
TUMBLER OR SIMILAR ARTICLE
Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed July 18, 1973, Ser. No. 380,272
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—6

237,032
STRAINER
Edward N. Montesi, Barrington, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed May 8, 1974, Ser. No. 467,990
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47



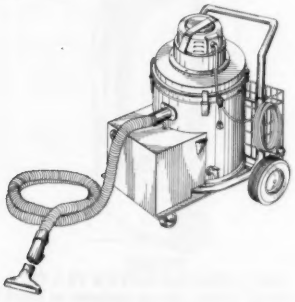


237,033
COOKING IMPLEMENT
Robert H. Oppenheimer, 3410 Lake Shore Drive, Chicago, Ill. 60657
Filed Feb. 25, 1974, Ser. No. 445,119
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—102

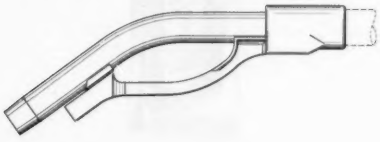


237,034
CHOPSTICK ASSEMBLY
Shaun Huey, 410 Atkinson Drive, 461, Honolulu, Hawaii 96814
Filed June 21, 1973, Ser. No. 372,299
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—105

237,035
VACUUM CLEANER
Glenn E. Berendes, 142 W. Park, Butte, Mont. 59791, and Robert D. Berendes, 30 Northern Pacific Ave., Belgrade, Mont. 59714
Filed Nov. 2, 1973, Ser. No. 412,445
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—166

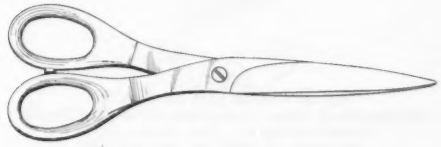


237,036
POWER COUPLING HANDLE FOR USE WITH VACUUM CLEANERS
John Edward Neceda, Princeton, N.J., assignor to General Signal Corporation
Filed Oct. 15, 1973, Ser. No. 406,775
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D7—173



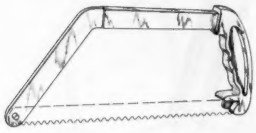
237,037
WOOD CHISEL
Bengt Bruno Brunosson, Enkoping, Sweden, assignor to AB Bahco Verktyg
Filed June 17, 1974, Ser. No. 479,806
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—47

237,038
SCISSORS
I. M. Laurenti, % Lindar Mfg. Corporation, 432 Park Ave. S., New York, N.Y. 10016
Original design application June 28, 1973, Ser. No. 374,363. Divided and this application Apr. 8, 1974, Ser. No. 458,566
Term of patent 7 years
Int. Cl. D8—*03*
U.S. Cl. D8—57

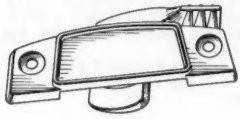


237,039
FAUCET AND VALVE SEAT DRESSING STONE
Joseph E. Bartlett, 215 S. Parker Ave., Olathe, Kans. 66601
Filed Mar. 8, 1974, Ser. No. 449,252
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—90

237,040
SAW
Carl J. Addis, 115 Valley Drive, Casper, Wyo. 82601
Filed May 1, 1974, Ser. No. 465,905
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—96



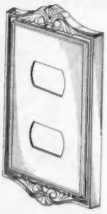
237,041
WINDOW LATCH
Sheldon Ruderfer, Woodbridge, Va., assignor to North American Die Casting Corporation, Fredericksburg, Va.
Filed Mar. 4, 1974, Ser. No. 447,590
Term of patent 14 years
Int. Cl. D8—*07, 09*
U.S. Cl. D8—111



237,042
RECEPTACLE COVER PLATE
Shinjiro Mori, Tokyo, Japan, assignor to Mori Denki Manufacturing Co., Ltd., Osaka, Japan
Filed Feb. 12, 1974, Ser. No. 441,825
Claims priority, application Japan Aug. 19, 1973
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—184

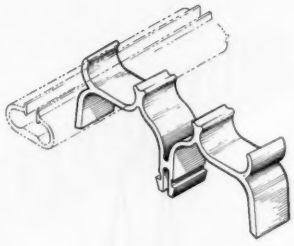
237,043
RECEPTACLE COVER PLATE
Shinjiro Mori, Tokyo, Japan, assignor to Mori Denki Manufacturing Co., Ltd., Osaka, Japan
Filed Feb. 12, 1974, Ser. No. 441,826
Claims priority, application Japan Aug. 19, 1973
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—184

237,044
RECEPTACLE COVER PLATE
Shinjiro Mori, Tokyo, Japan, assignor to Mori Denki Manufacturing Co., Ltd., Osaka, Japan
Filed Feb. 12, 1974, Ser. No. 441,827
Claims priority, application Japan Aug. 19, 1973
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—184



237,045
RECEPTACLE COVER PLATE
Shinjiro Mori, Tokyo, Japan, assignor to Mori Denki Manufacturing Co., Ltd., Osaka, Japan
Filed Feb. 12, 1974, Ser. No. 441,828
Claims priority, application Japan Aug. 19, 1973
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—184

237,046
BRACKET FOR ELECTRICAL CONDUCTOR CHANNELS
Donald Alfred Sloan, Winston-Salem, N.C., assignor to Envirotech Corporation
Filed Mar. 25, 1974, Ser. No. 454,994
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—229

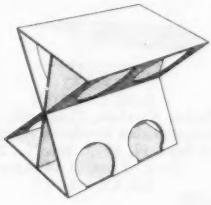


237,047
BOTTLE OR THE LIKE
James L. Westrich, Algoma, Wis., assignor to Algoma Net Company, Milwaukee, Wis.
Filed May 24, 1973, Ser. No. 363,761
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—63

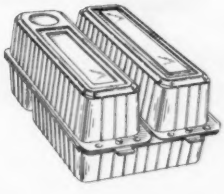
237,048
BOTTLE
Humberto Pilato Blat, Actor Mora 14, Valencia, Spain
Filed Nov. 6, 1973, Ser. No. 413,199
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—84

237,049
COMBINED BOTTLE AND CLOSURE THEREFOR
Herbert Ashley Atkins, Maidenhead, England, assignor to Beecham Group Ltd., Brentford, Middlesex, England
Filed Aug. 15, 1972, Ser. No. 280,857
Claims priority, application Great Britain Feb. 21, 1972
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—144

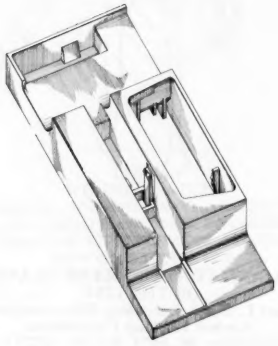
237,050
PACKAGING CONTAINER FOR GLASSWARE OR THE LIKE
Robert L. Forté, Lancaster, Ohio, assignor to Anchor Hocking Corporation
Filed Mar. 20, 1974, Ser. No. 452,723
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—176



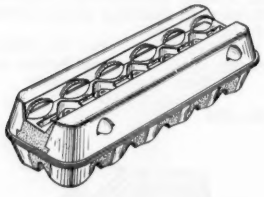
237,051
PACKAGING CONTAINER
Bryan Ernest Sydney Ruskin, Magnolia Lodge, Watford Road, St. Albans, Hertfordshire, England, and Peter James Webber, 45 Bedmond Road, Leverstock Green, Hertfordshire, England
Filed Oct. 23, 1973, Ser. No. 408,517
Claims priority, application Great Britain Apr. 25, 1973
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185



237,052
RAZOR TRAY
Richard J. Petrillo, Norwell, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Jan. 22, 1974, Ser. No. 435,536
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—186

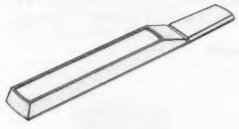


237,053
EGG CARTON
Bent Møller, Vaerlose, Denmark, assignor to Aktieselskabet Brodrene Hartmann
Filed Sept. 12, 1973, Ser. No. 396,562
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—190

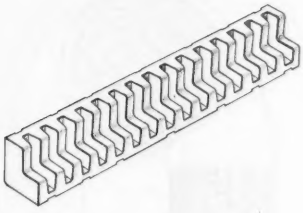


237,054
PACKAGING CONTAINER OR THE LIKE
Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Nov. 1, 1972, Ser. No. 302,878
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

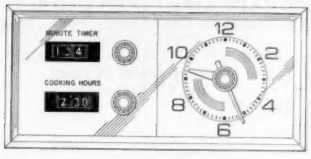
237,055
PACKAGING CONTAINER FOR THERMOMETER OR SIMILAR ELONGATED ARTICLE
John Pardo, Yonkers, N.Y., assignor to Bio-Medical Sciences, Inc., Fairfield, N.J.
Filed June 20, 1973, Ser. No. 371,678
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—237



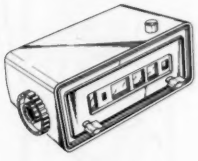
237,056
HOLDER FOR RETAINING A PLURALITY OF PANELS AT THE CORNERS THEREOF
James J. Westgerdes, Fort Recovery, Ohio, assignor to Premiere Corporation, Dayton, Ohio
Filed July 30, 1973, Ser. No. 383,522
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—293



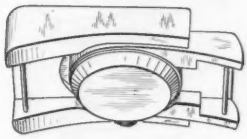
237,057
CONTROL PANEL FOR A COMBINED CLOCK AND TIMER
Paul T. Flumm, Oakville, and Vernon B. Harris, Waterbury, Conn., assignors to Robertshaw Controls Company, Richmond, Va.
Filed Apr. 30, 1974, Ser. No. 465,482
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—2



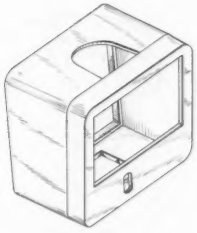
237,058
DIGITAL CLOCK
Nobuyoshi Hirosawa, Shimosuwa-machi, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Shimosuwa-machi, Japan
Filed June 13, 1973, Ser. No. 369,615
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



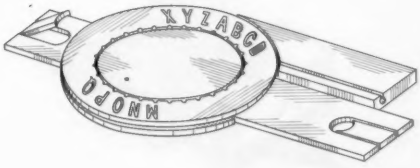
237,059
WRIST WATCH
Gilbert Herold, 24 Rue Isenbart, 2500 Besancon, France
Filed July 19, 1973, Ser. No. 380,656
Claims priority, application France Jan. 26, 1973
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39



237,060
PYROMETER COVER
William E. Engelhard, Owego, N.Y., assignor to Pyro-Serv Instruments, Inc., North Arlington, N.J.
Filed July 19, 1973, Ser. No. 380,613
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46

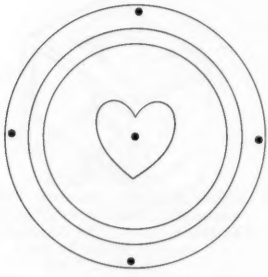


237,061
BASE FOR ANNULAR TEMPLATE AND SCRIBER
Hyok Sang Lew, 1620 E. Blacklidge Drive 6, Tucson, Ariz. 85719
Filed May 29, 1973, Ser. No. 364,877
Term of patent 14 years
Int. Cl. D10—*99*; D19—*06*
U.S. Cl. D10—61

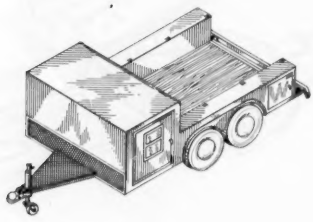


237,062
PLATFORM SCALE
Kazuharu Teraoka, Tokyo, Japan, assignor to Teraoka Seikosho Co., Ltd., Tokyo, Japan
Filed Apr. 5, 1973, Ser. No. 348,014
Claims priority, application Japan Dec. 4, 1972
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91

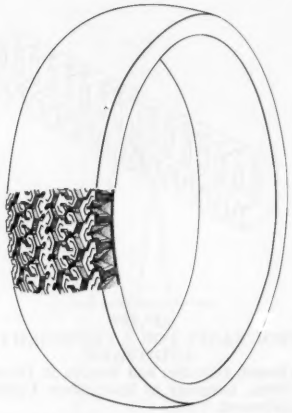
237,063
WATCH FACE
Paulette G. Kelman, 19264 Pacific Coast Highway, Malibu, Calif. 90265
Filed Nov. 27, 1970, Ser. No. 26,202
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—123



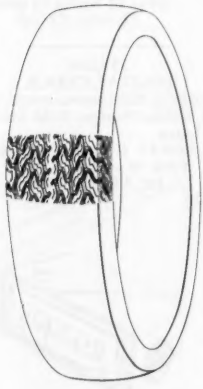
237,064
TRAILER
Dale Edward Whitney, 123 Horton Ave., Nampa, Idaho 83651
Filed Nov. 9, 1973, Ser. No. 414,231
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—105



237,065
PNEUMATIC TIRE TREAD AND BUTTRESS
James F. Newman, St. Clair Shores, Mich., assignor to Uniroyal, Inc.
Filed Aug. 5, 1974, Ser. No. 494,435
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

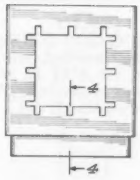


237,066
PNEUMATIC TIRE TREAD AND BUTTRESS
Carl F. Smajd, St. Clair Shores, Mich., assignor to Uniroyal, Inc.
Filed May 1, 1974, Ser. No. 465,935
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—151

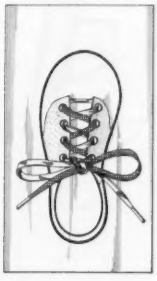


237,067
WHEEL
Ulf Angelo Sandberg, 35 Bangatan, 41464 Goteborg, Sweden
Filed Nov. 28, 1973, Ser. No. 419,784
Claims priority, application Sweden May 30, 1973
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

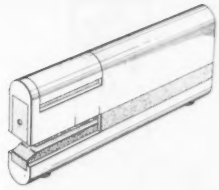
237,068
BUILDING BLOCK
Richard O. Bartz, Edina, Minn. (7017 Mark Terrace Drive, Minneapolis, Minn. 55435)
Filed Aug. 2, 1973, Ser. No. 385,090
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 R



237,069
LACING AND TYING EDUCATIONAL DEVICE
Alma J. Sammers, 2 W. Cornwall St., Leesburg, Va. 22075
Filed Apr. 13, 1973, Ser. No. 350,897
Term of patent 3½ years
Int. Cl. D19—*07*
U.S. Cl. D19—62



237,070
MAGNETIC TAPE HAND PUNCH
George A. Wilson, Portola Valley, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Feb. 11, 1974, Ser. No. 441,115
Term of patent 3½ years
Int. Cl. D19—*02*
U.S. Cl. D19—72



237,071
BOW AND ARROW TRIGGER
Tim W. Whiteford, 13730 Oak Wood, Sugar Land, Tex. 77478, and Horace E. Freeman, Jr., 5914 Libbey, Houston, Tex. 77018
Filed Oct. 29, 1974, Ser. No. 518,237
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—5

237,072
HOLDER FOR FISHING REEL AND SIGNAL DEVICE
Lawrence L. Muehl and Theodore Montgomery, both of Box 113, Frankfort, S. Dak. 57440
Filed July 24, 1974, Ser. No. 491,395
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—13

237,073
GUN HOLSTER
Frederick Elwood Hershman, P.O. Box 1783, 790 Newton Way, Costa Mesa, Calif. 92626
Filed Sept. 30, 1974, Ser. No. 510,547
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13

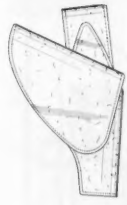
237,074
GUN HOLSTER
Robert Taylor, Houston, Tex., assignor to F–15 Corp., Houston, Tex.
Filed Oct. 24, 1974, Ser. No. 517,500
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13

237,075
GUN HOLSTER
Robert Taylor, Houston, Tex., assignor to F–15 Corp., Houston, Tex.
Filed Oct. 24, 1974, Ser. No. 517,501
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13

237,076
GUN HOLSTER
Robert Taylor, Houston, Tex., assignor to F–15 Corp., Houston, Tex.
Filed Oct. 24, 1974, Ser. No. 517,502
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13

237,077
GUN HOLSTER
Robert Taylor, Houston, Tex., assignor to F–15 Corp., Houston, Tex.
Filed Oct. 24, 1974, Ser. No. 517,536
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13

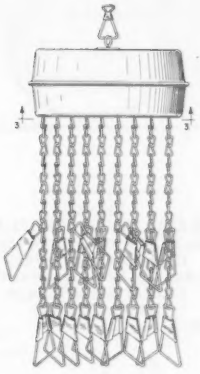
237,078
GUN HOLSTER
Robert Taylor, Houston, Tex., assignor to F–15 Corp., Houston, Tex.
Filed Oct. 24, 1974, Ser. No. 517,537
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13



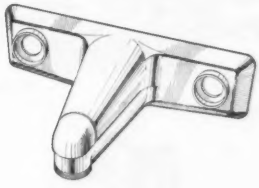
237,079
GUN HOLSTER
Robert Taylor, Houston, Tex., assignor to F–15 Corp., Houston, Tex.
Filed Oct. 24, 1974, Ser. No. 517,538
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13

237,080
FISHING ROD HOLDER
Gary K. Pettee, Rte. 3, Box 277, Roselle, Ill. 60172
Filed Jan. 20, 1975, Ser. No. 542,438
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—13

237,081
FISH STRINGER
Daniel W. Helton, 115 Ruth St., Sikeston, Mo. 63801
Continuation-in-part of design application Ser. No. 406,243, Oct. 15, 1973. This application Dec. 9, 1974, Ser. No. 530,593
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—22

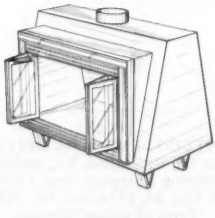


237,082
FITTING FOR A BATHTUB
Robert J. Keller III, Richmond, Va., assignor to Kel-Win Manufacturing Company, Inc., Chester, Va.
Filed Aug. 20, 1974, Ser. No. 499,048
Term of patent 14 years
Int. Cl. 23—*01*
U.S. Cl. D23—32



237,083
STOVE
J. Burrell Chase, 357 Los Gatos Blvd., Los Gatos, Calif. 95030
Filed Aug. 10, 1973, Ser. No. 387,291
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

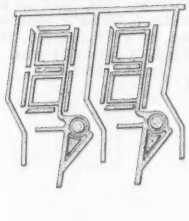
237,084
FREESTANDING FIREPLACE
Edgar H. Collver, 2000 E. 15th St., Coquille, Oreg. 97423
Filed Aug. 13, 1974, Ser. No. 471,297
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



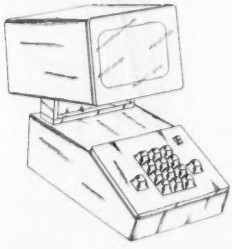
237,085
AGITATOR FOR MAINTAINING A THAWED ZONE IN A FROZEN POND
George Doyle Clugston, P.O. Box 581, R.R. 3, Pittsburg, Kans. 66762
Filed Oct. 10, 1972, Ser. No. 295,897
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—167

237,086
DENTAL FLOSS APPLICATOR AND DISPENSER
Fred M. Gore, 1919 Walnut Plaza, Apt. 2024, Carrollton, Tex. 75006
Filed Aug. 20, 1973, Ser. No. 389,580
Term of patent 3½ years
Int. Cl. D24—*99*
U.S. Cl. D24—1 D

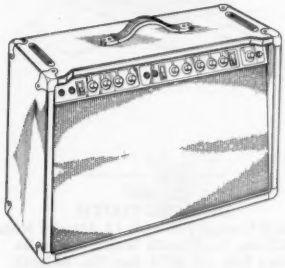
237,087
ANODE AND CATHODE ARRANGEMENT FOR A NUMERAL DISPLAY
Abul Abbas Mesbahuddin Ahmed, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Dec. 12, 1973, Ser. No. 424,136
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



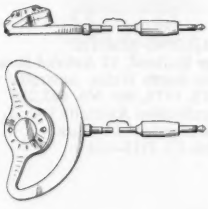
237,088
DISPLAY STATION AND DATA COMMUNICATIONS TERMINAL
Walter W. Wiebe, 1915 Alexander Road, Raleigh, N.C. 27608
Filed Apr. 25, 1974, Ser. No. 464,268
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



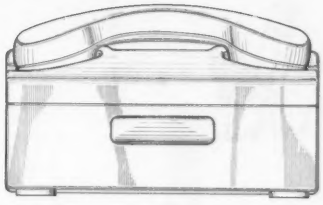
237,089
COMBINED AMPLIFIER AND LOUDSPEAKER FOR ELECTRICAL MUSICAL INSTRUMENTS
Thomas A. Walker, Tustin, Calif., assignor to Music Man, Inc., Anaheim, Calif.
Filed Oct. 5, 1973, Ser. No. 404,106
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D26—14 G



237,090
EARPHONE
Haruo Yanagawa, Tokyo, Japan, assignor to Ashida Onkyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 16, 1973, Ser. No. 406,867
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 H

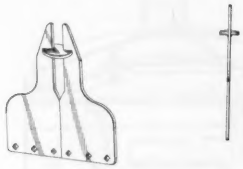


237,091
TELEPHONE SUBSET
Dieter Blumenau, Joseph-Haydn-Str. 2, Ditzingen, Germany
Filed Dec. 4, 1973, Ser. No. 421,554
Claims priority, application Germany July 26, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

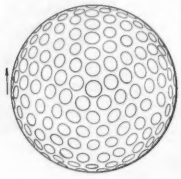


237,092
ANIMAL DRINKING FOUNTAIN OR THE LIKE
Gerald L. Pochyla and William Ralph Smith, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.
Filed Oct. 31, 1968, Ser. No. 14,250
Term of patent 14 years
The term of this patent subsequent to Nov. 5, 1982, has been disclaimed
Int. Cl. D30—*03*
U.S. Cl. D30—13

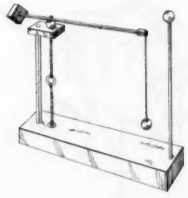
237,093
ANIMAL IDENTIFICATION TAG
Charles L. Eldredge, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 23, 1974, Ser. No. 472,685
Term of patent 14 years
Int. Cl. D30—*08*
U.S. Cl. D30—43



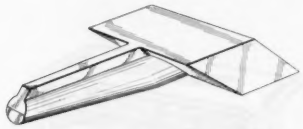
237,094
GOLF BALL
Frank S. Martin, Cranston, R.I., and Thaddeus A. Pietraszek, Waterbury, Conn., assignors to Uniroyal, Inc.
Filed July 28, 1972, Ser. No. 276,218
Term of patent 14 years
The term of this patent subsequent to Sept. 18, 1987, has been disclaimed
Int. Cl. D21—*02*
U.S. Cl. D34—5 QQ



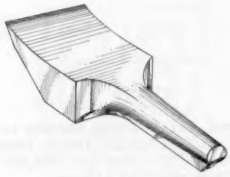
237,095
AMUSEMENT SWINGING TOY
Dale W. Grant, 608 Birky Place, Fort Collins, Colo. 80521
Filed Mar. 18, 1974, Ser. No. 451,790
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 A



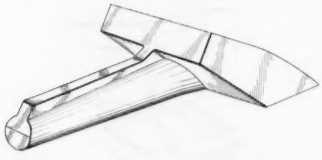
237,096
DIGGING TOOTH
Richard George Holland, 12 Arterial Road, Killara, New South Wales, Australia
Filed Feb. 13, 1974, Ser. No. 442,262
Claims priority, application Australia Dec. 28, 1973
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D39—1 R



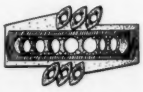
237,097
DIGGING TOOTH
Richard George Holland, 12 Arterial Road, Killara, New South Wales, Australia
Filed Feb. 13, 1974, Ser. No. 442,263
Claims priority, application Australia Sept. 3, 1973
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D39—1 R



237,098
DIGGING TOOTH
Richard George Holland, 12 Arterial Road, Killara, New South Wales, Australia
Filed Feb. 13, 1974, Ser. No. 442,264
Claims priority, application Australia Dec. 7, 1973
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D39—1 R



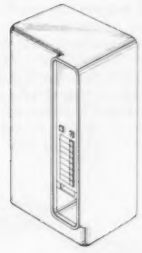
237,099
FINGER RING
Bernard I. Mechanic, 2425 Oakton St., Evanston, Ill. 60202
Filed Feb. 5, 1973, Ser. No. 329,583
Term of patent 3½ years
Int. Cl. D11—*01*
U.S. Cl. D45—10 C



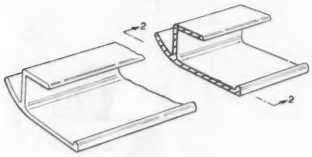
237,100
FINGER RING
Bernard I. Mechanic, 2425 Oakton St., Evanston, Ill. 60202
Filed Feb. 5, 1973, Ser. No. 329,584
Term of patent 3½ years
Int. Cl. D11—*01*
U.S. Cl. D45—10 C

237,101
SWING-ARM FUEL DISPENSER FOR SERVICE STATIONS
John S. Loy, Elmer A. Robbins, and Melvin C. Hankel, Fort Wayne, Ind., assignors to Tokheim Corporation, Fort Wayne, Ind.
Filed May 21, 1973, Ser. No. 361,891
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D52—2 A

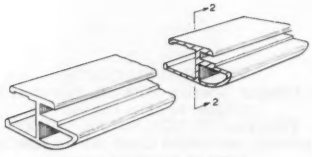
237,102
VENDING MACHINE
Malcolm Douglas Norman Withnall, Warwick, England, assignor to Mars Limited
Filed Dec. 29, 1972, Ser. No. 319,787
Claims priority, application Great Britain June 30, 1972
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3 R



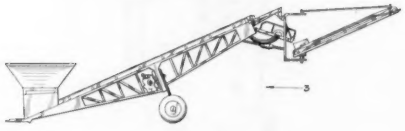
237,103
EXTRUDED MEMBER FOR THE SLIDING ROOF OF A VEHICLE
John Albert Fisher, Sutton Coldfield, England, assignor to Weathershields Limited
Filed Feb. 27, 1974, Ser. No. 446,484
Claims priority, application Great Britain Sept. 14, 1973
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D54—1 R



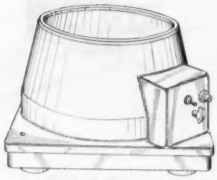
237,104
EXTRUDED MEMBER FOR THE SLIDING ROOF OF A VEHICLE
John Albert Fisher, Sutton Coldfield, England, assignor to Weathershields Limited
Filed Feb. 27, 1974, Ser. No. 446,486
Claims priority, application Great Britain Sept. 14, 1973
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D54—1 R



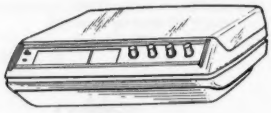
237,105
ARTICULATED CONVEYOR UNIT
Patrick O'Neill and Patrick Joseph Douglas, Dungannon, Northern Ireland, assignors to Powerscreen International Limited, Dungannon, Northern Ireland
Filed Mar. 14, 1973, Ser. No. 341,257
Claims priority, application Great Britain Aug. 26, 1972
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D55—1 C



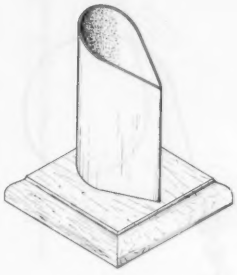
237,106
VIBRATOR ASSEMBLY BASE
Daniel J. Baljet, George A. Sodderland, and John D. H. Hania, London, Ontario, Canada, assignors to Advanced Automated Equipment Ltd.
Filed June 9, 1972, Ser. No. 261,564
Claims priority, application Canada Jan. 4, 1972
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 D



237,107
ELECTRIC PHONOGRAPH
Kiyoshi Shindo, Habikino-shi, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Mar. 30, 1973, Ser. No. 346,325
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R



237,108
EYEGLASS HOLDER
Jerome Mende, 109 Roman Ave., Staten Island, N.Y. 10314
Filed Sept. 17, 1973, Ser. No. 398,204
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D57—1 C

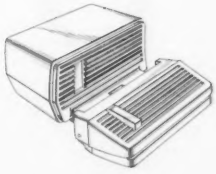


237,109
TELEPRINTER
Donald M. Genaro, Haworth, and Alvin R. Tilley, Red Bank, N.J., assignors to Teletype Corporation, Skokie, Ill.
Filed June 19, 1974, Ser. No. 480,774
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D64—11 C

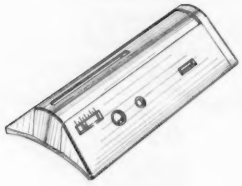
237,110
FONT OF SYSTEM-SERIES LOGOTYPES
N. Dominic Marucci, Philadelphia, Pa., assignor to Burroughs Corporation, Detroit, Mich.
Filed Apr. 10, 1973, Ser. No. 349,713
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B

237,111
SEWING MACHINE BELT GUARD OR SIMILAR ARTICLE
George D. La Police, Somerville, N.J., assignor to The Singer Company, New York, N.Y.
Filed Feb. 21, 1974, Ser. No. 444,592
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D70—2 A

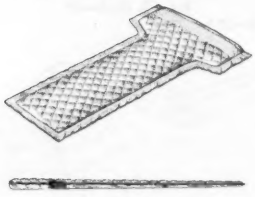
237,112
SEWING MACHINE FOOT CONTROLLER OR SIMILAR ARTICLE
Wayne A. Current, Cranford, N.J., assignor to The Singer Company, New York, N.Y.
Filed Mar. 13, 1974, Ser. No. 450,914
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D70—2 B



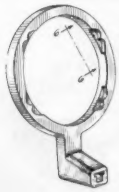
237,113
INTRAVASCULAR INFUSION UNIT
Seymour Hoff and Sharon Kehr, San Jose, and Richard G. Buckles, Menlo Park, Calif., and Denis H. Nelson, Wheaton, Ill., assignors to ALZA Corporation
Filed Nov. 14, 1973, Ser. No. 415,691
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F



237,114
DIAPER FOR BABIES
Tor Arne Fröidh, Stenungsund, Hans Erik Waldén, Goteborg, and Leif Urban Roland Widlund, Molnlycke, Sweden, assignors to Molnlycke AB, Goteborg, Sweden
Filed Apr. 2, 1974, Ser. No. 457,241
Claims priority, application Sweden Oct. 4, 1973
Term of patent 14 years
Int. Cl. D24—*05*
U.S. Cl. D83—1 A

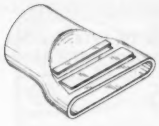


237,115
X-RAY COLLIMATING EXTENSION TUBE POSITIONING RING FOR ANTERIOR TYPE DENTAL X-RAY FILM HOLDERS
Charles F. Stevenson, Elgin, Ill., assignor to Rinn Corporation, Elgin, Ill.
Filed Apr. 18, 1974, Ser. No. 461,952
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 H

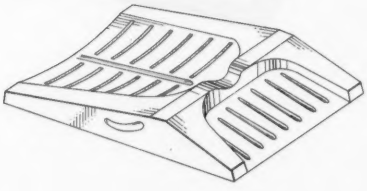


237,116
VEIN STRIPPER WITH VARIABLE HEAD DIAMETER
Fred Åge Gunnar Ekbladh, Saro, Sweden, assignor to Astra-Sjuco AB, Goteborg, Sweden
Filed Oct. 16, 1973, Ser. No. 406,830
Claims priority, application Sweden Apr. 19, 1973
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 R

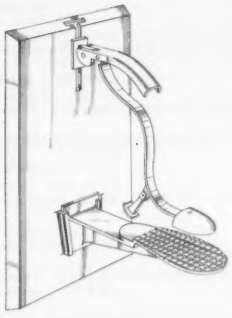
237,117
ELECTRIC HAIR DRYER NOZZLE
Eli Orsoff, Selden, N.Y., assignor to Continental Hair Products, Inc., Edison, N.J.
Filed Aug. 30, 1973, Ser. No. 393,261
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



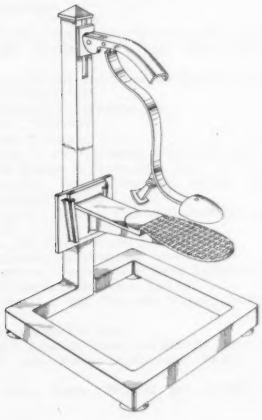
237,118
TRAY FOR SHAMPOOING INFANTS
Georgia I. Grelle, 211 Vista Ave., Round Rock, Tex. 78664
Substituted for abandoned design application Ser. No. 215,250, Jan. 3, 1972. This application Nov. 2, 1973, Ser. No. 412,075
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D86—10 F



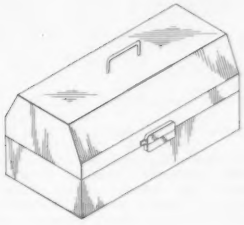
237,119
WALL MOUNTED SHOE SHINE APPARATUS
Robert C. Randolph, 2300 19th St. NW., Washington, D.C. 20009
Filed June 4, 1973, Ser. No. 366,294
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D86—12



237,120
SHOE SHINE APPARATUS WITH STAND
Robert C. Randolph, 2300 19th St., NW., Washington, D.C. 20009
Filed June 4, 1973, Ser. No. 366,293
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D86—12



237,121
TOOL CHEST OR SIMILAR ARTICLE
Mark J. Metzner, Glencoe, Ill., assignor to Glovemakers, Inc., Chicago, Ill.
Filed June 6, 1974, Ser. No. 477,044
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1



237,122
CAROUSEL ADVERTISING DISPLAY SIGN FOR STORES
Everett Burgess Baker, Burbank, Calif., assignor to Don Fedderson Productions, Inc., Studio City, Calif.
Filed Mar. 7, 1974, Ser. No. 449,059
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF OCTOBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Foster, John E., 3,911,445.

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A-T-O Inc.: *See—*
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AB Bofors: *See—*
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Abeles, Richard M. Liquid cleaning compositions. 3,910,855, Cl. 252-527.000.

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Abrahamson, Gerald R.; and Mereness, Charles E., to Minnesota Mining and Manufacturing Company. Coated laminated carbide cutting tool. 3,909,895, Cl. 29-95.00A.

Abromavage, John C.; and Ryden, James W., to Amerco, Inc. Weight equalizing device for automobile bumper hitches. 3,910,604, Cl. 280-406.00A.

ACF Industries, Incorporated: *See—*
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Adam, Amos, to Boussois S.A. Device for testing the continuity of an electrical network deposited on a glass sheet. 3,911,357, Cl. 324-51.000.

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Allais, Andre; and Meier, Jean, to Roussel-UCLAF. Novel trifluoromethyl-quinolines. 3,910,922, Cl. 260-287.00R.

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Alt, Paul Matthew; Pleshko, Peter; and Schlig, Eugene Stewart, to International Business Machines Corporation. Selection system for matrix displays requiring AC drive waveforms. 3,911,421, Cl. 340-324.00M.

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American Air Filter Company, Inc.: *See—*
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Anderson, Carlton O. Apparatus for making a hollow hamburger. 3,909,881, Cl. 17-32.000.

Anderson, Joseph A.; Morlock, Ruben D.; and Neukom, Chester G., to Haybuster Manufacturing, Inc. Mobile hay stacker conveyor construction. 3,910,438, Cl. 214-518.000.

Anderson, Robert F., to Universal Oil Products Company. Moving bed reactor conversion process for particulate containing hydrocarbons such as shale oil and tar-sands oil. 3,910,834, Cl. 208-59.000.

Anderson, Robert F., to Universal Oil Products Company. Plural stages of HF alkylation of isoparaffin with a mono-olefin. 3,911,043, Cl. 260-683.450.

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Baldocchi, Archie. Holster for hand guns. 3,910,469, Cl. 224-2.00C.
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Barkow, William Henry, to RCA Corporation. Waveform generating circuit. 3,911,295, Cl. 307-261.000.
Barnes, Casper William, Jr., to Dresser Industries, Inc. Variable throat venturi apparatus for mixing and modulating liquid fuel and intake air to an internal combustion engine. 3,911,063, Cl. 261-50.00R.
Barredo, Joseph G. Below-the-knee prosthesis. 3,909,855, Cl. 3-16.000.
Bartek, Douglas J.; and Howell, Thomas H., to Honeywell Information Systems, Inc. Nonlinear code generator and decoder for transmitting data securely. 3,911,216, Cl. 178-22.000.
Bartl, Herbert: *See—*
Huper, Fritz; Rauenbusch, Erich; Schmidt-Kastner, Gunter; Bomer, Bruno; and Bartl, Herbert, 3,910,825.
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Bartram, Nial C.: *See—*
Brenneman, J. Edward; and Bartram, Nial C., 3,909,938.
Barwick, Morris N., to Exxon Research and Engineering Company. FM demodulator and control circuitry for a facsimile system. 3,911,207, Cl. 178-6.000.
BASF Aktiengellschaft: *See—*
Marosi, Laszlo; Ripperger, Willi; and Schwarzmann, Matthias, 3,911,088.
Merkel, Karl; Datow, Joachim; Paetsch, Juergen; Hoffmann, Herwig; and Winderl, Siegfried, 3,910,983.
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Montiglio, Ugo; Basile, Giampiero; Aspes, Pierfrancesco; and Foco, Luigi, 3,911,095.
Basile, Mario J. Method of soil treatment. 3,909,975, Cl. 43-124.000.
Baskettes Ltd.: *See—*
Giesfeldt, John C., 3,910,548.
Bassing, Friedrich Wilhelm; and Hofmann, Gerhard, to Alfa-Laval Bergedorfer Eisenwerke GmbH. Fabric collecting means for power looms. 3,910,319, Cl. 139-308.000.
Bates, Norman Andrew; and Tarr, Robert Earl, to Procter & Gamble Company, The. Process for preparing texturized vegetable protein. 3,911,157, Cl. 426-459.000.
Bates, Roger D.; and Lampson, Butler W., to Xerox Corporation. Controller for cursor positioning on a display medium. 3,911,419, Cl. 340-324.0AD.
Battelle Memorial Institute: *See—*
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Bauer, F. Michael, Jr.: *See—*
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Baum, Laszlo: *See—*
Widauer, Josef Olav; Lang, Konrad; Baum, Laszlo; and Szabo, Suzanne, 3,910,888.
Bausch & Lomb Incorporated: *See—*
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Baxter Laboratories, Inc.: *See—*
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Bayer Aktiengesellschaft: *See—*
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Bentz, Francis; and Nischk, Gunther, 3,910,867.
Bien, Hans-Samuel; and Klauke, Brich, 3,910,758.
Boshagen, Horst; and Plempel, Manfred, 3,911,126.
Draber, Wilfried; Dickore, Karlfried; and Timmler, Helmut, 3,910,909.
Draber, Wilfried; Plempel, Manfred; and Buchel, Karl Heinz, 3,910,936.
Hartmann, Peter; Roos, Ernst; Esch, Erich; Fries, Hermann; and Hentze, Gunter, 3,911,045.

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Wollweber, Hartmund; and Flucke, Winfried, 3,911,013.
Wollweber, Hartmund; and Flucke, Winfried, 3,911,014.

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Beaudoin, Gordon L.; Foote, Lawrence R.; Hough, Jerome F.; and Merchant, Stanley R., to Ford Motor Company. Exhaust gas air fuel ratio sensor. 3,911,386, Cl. 338-34.000.

Bebinger, Jack E., to White-Westinghouse Corporation. Shaped aperture in enameled sheet metal. 3,910,004, Cl. 52-758.00D.

Becker, Edward Eugene; and Kurokawa, Kaneyuki, to Bell Telephone Laboratories, Incorporated. Hyperbolic type optical fiber lens coupler for coupling the fiber to an optical line source. 3,910,677, Cl. 350-96.00C.

Becker, Kurt; and Seidel, Hans-Georg, to Heye, Hermann. Drive for movable elements such as rams and tongs in a machine for making bottles and similar containers from plasticizable material. 3,910,419, Cl. 214-1.0BC.

Becker, Robert L., to Dealers Truck Equipment Inc. Truck body mounting clip. 3,910,624, Cl. 296-35.00R.

Beckman Instruments, Inc.: *See—*
Cederstrand, Carl N.; and Keenan, Charles A., 3,911,277.

Beckwell, George F., to Teledyne Pines. Cam programmed control. 3,910,161, Cl. 91-375.00R.

Beers, Ronald W., to Exxon Research and Engineering Company. Anticorrosive coating system. 3,910,797, Cl. 106-1.000.

Behrenz, Wolfgang: *See—*
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Belasco, Norman: *See—*
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Mullins, Joe Hill, 3,911,219.
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Bell, William E., to Diax Corporation. Laser spectroscopy. 3,911,276, Cl. 250-343.000.

Bellwood, Philip Ross: *See—*
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Beloit Corporation: *See—*
Sokolow, Nickolas N., 3,910,430.

Belov, Gennady Petrovich; Dzhabiev, Taimuraz Savelievich; Dyachkovsky, Fridrikh Stepanovich; Smirnov, Vyacheslav Ivanovich; Karpova, Nelli Dzhavkharovna; Brikenshtein, Khaim-Mordkhe Aronovich; Gerasina, Matrena Petrovna; Kuzmin, Vladimir Evgenievich; Matkovsky, Petr Evgenievich; Russiyan, Ljudmila Nikolaevna; Pomogailc, Anatoly Dmitrievich; Chirkov, Nikolai Mikhailovich, deceased; and by Chirkov, Mikhail Nikolaevich, administrator. Method of producing butene-1. 3,911,042, Cl. 260-683.15D.

Bender, David John; and Kubovich, Frank Steve, to Johns-Manville Corporation. Apparatus for cutting a mat of bonded fiber. 3,910,145, Cl. 83-623.000.

Bendix Corporation, The: *See—*
Gardner, Delbert J.; Sisco, William C.; Grabb, Frederick G.; and Owens, Carl D., 3,910,046.
Gardner, Delbert J., 3,910,048.
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Benerito, Ruth R.: *See—*
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Beninger, Robert L., to H. G. Weber and Company, Inc. Apparatus for packaging stacked articles. 3,910,011, Cl. 53-124.00A.

Bennetts, John F. High and low temperature warning device. 3,911,412, Cl. 340-227.100.

Benrus Corporation: *See—*
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Bentz, Francis; and Nischk, Gunther, to Bayer Aktiengesellschaft. Shaped structures of acrylonitrile polymers with permanent antistatic properties. 3,910,867, Cl. 260-85.50S.

Bentz, Francis: *See—*
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Rother, Eberhard; and Beranek, Miroslav, 3,909,875.

Bergan, Reuben A., to Dresser Industries, Inc. Axial ion beam accelerator tube having a wobbled target. 3,911,282, Cl. 250-442.000.

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Bergkamp, Robert L.; and Bergkamp, Helen G. Folding bracket mechanism. 3,909,981, Cl. 49-340.000.

Berglund, Arne Emil: *See—*
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Bergougnou, Maurice A.: *See—*
Mayer, Ivan; and Bergougnou, Maurice A., 3,910,769.

Berni, Ralph J.; Benerito, Ruth R.; Gonzales, Elwood J.; and Muller, Linda L., to United States of America, Agriculture. Azeotropic solvents for permanent press treatments of cotton and cotton blend fabrics. 3,910,760, Cl. 8-186.000.

Bernstein, Edith; Inaba, Makoto; and Garmaise, David Lyon, to Abbott Laboratories. Chelocardin derivatives. 3,910,906, Cl. 260-247.50R.

Bertin & Cie: *See—*
Hache, Jean Georges Edouard Joseph; Allioud, Jean-Pierre Achille; and Doyotte, Claude Charles, 3,910,375.

Bertrem, Brad E.; and Young, Dennis L., to Dover Corporation. Butterfly valves disc with dovetail groove. 3,910,555, Cl. 251-306.000.

Bettinger, Erwin: *See—*
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Beusch, Christian. Continuously operating ice making apparatus. 3,910,060, Cl. 62-188.000.

Beverley, William R.: *See—*
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Bevilacqua, Frank, to Combustion Engineering, Inc. Vessel restraint device. 3,910,447, Cl. 220-3.000.

Biddell, David Colin; Dawson, Graham Robert; and Sansome, Dennis Hugh, to National Research Development Corporation. Vibratory forming of materials. 3,910,085, Cl. 72-56.000.

Bien, Hans-Samuel; and Klauke, Brich, to Bayer Aktiengesellschaft. Dyeing wool with fluorine substituted pyrimidine containing azo reactive dyestuff. 3,910,758, Cl. 8-41.00R.

Biggs, Edward H. Vehicle speed safety signal system. 3,911,393, Cl. 340-62.000.

Billings, John C., Jr.: *See—*
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Bio-Med Devices, Inc.: *See—*
Stewart, Jeffrey Lee, 3,910,270.

Bio-Medicus, Inc.: *See—*
Kletschka, Harold D.; and Rafferty, Edson H., 3,910,281.

Biram, Brian Edgar Lund, to C.C.L. Systems Limited. Cable attachments. 3,910,055, Cl. 61-45.000.

Birnkraut, Hans-Walter: *See—*
Lutze, Siegfried; Birnkraut, Hans-Walter; and Moser, Hubert, 3,910,870.

Bishop, Ian Dennis: *See—*
Tuck, Ernest Victor; Glew, Derek Aubrey; and Bishop, Ian Dennis, 3,910,832.

Bishop, Marion M., to Boeing Company, The. Fail-safe power supply. 3,911,324, Cl. 317-33.0VR.

Bishop, Robert J.: *See—*
Wulbrecht, Robert M.; and Bishop, Robert J., 3,910,596.

Bither, Tom Allen, Jr.; and Jeitschko, Wolfgang Karl, to Du Pont de Nemours, E. I., and Company. Lithium haloboracites. 3,911,085, Cl. 423-277.000.

Blackman, Sol: *See—*
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Blackmar, Guy E.; Wight, Robert C.; and Smith, Richard B., to Nalco Chemical Company. Continuous Grignard reactors. 3,911,037, Cl. 260-665.00G.

Blakely Industries: *See—*
Blakely, James T., 3,910,318.

Blakely, James T., to Blakely Industries. Empty quill deflector and guide for loom filling winder. 3,910,318, Cl. 139-262.000.

Blanch, Julian E.: *See—*
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Blandin Paper Company: *See—*
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Blanshine, Allison W.: *See—*
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Blaskovic, Dino. Rock bolt remover. 3,910,139, Cl. 81-53.200.

Bleau, Charles D., to International Business Machines Corporation. Document feed apparatus. 3,910,570, Cl. 271-245.000.

Bleher, William A.: *See—*
McGrath, Ronald P.; and Bleher, William A., 3,911,485.

Bleifuss, Rodney L., to University of Minnesota, The Regents of the. High temperature direct reduction process for iron ore agglomerates. 3,910,786, Cl. 75-34.000.

Blewitt, Donald D.; Cameron, Frank L.; and Vondracek, Charles H., to Westinghouse Electric Corporation. Outdoor current limiting fuse. 3,911,385, Cl. 337-202.000.

Bloch, Herman S.; Illingworth, George E.; and Lester, George W., to Universal Oil Products Company. Alkylaromatic sulfonate detergent process. 3,910,994, Cl. 260-505.00A.

Board of Regents for the Oklahoma Agricultural and Mechanical Colleges Acting on Behalf of Oklahoma State University of Agriculture and Applied Science: *See—*
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Bobel, Robert J., II: *See—*
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Boch, Jean Christian: *See—*
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Bock, Hartmut; Stieger, Helmut; Jahn, Helmut; and Winkelmann, Detlef, to Hoechst Aktiengesellschaft. Apparatus for monitoring and replenishing toner concentrations. 3,910,459, Cl. 222-56.000.

Bodenseewerk Geratetechnik GmbH: *See—*
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Boeing Company, The: *See—*
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Hoffstedt, Donald J., 3,910,105.
James, Varnell L.; and Hill, Eugene G., 3,910,530.
Jones, Everett E., 3,910,087.
Shultz, William M., 3,910,216.
Soderman, Kenneth L., 3,910,215.

Boesch, Donald Edward; and Koita, Yusuf Taher, to Western Electric Company, Incorporated. Transfer molding thermosetting polymeric material. 3,911,075, Cl. 264-329.000.

Boggs, Roger L.; and Dester, Delbert D., to Caterpillar Tractor Company. Track roller having resilient mounted treads and threaded-on retainers. 3,910,128, Cl. 74-230.010.

Bohna Engineering & Research Inc.: *See—*
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Bohret, Hartmut Heiner: *See—*
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Boileau, Jacques, to Compagnie Generale des Etablissements Michelin. Tire having carcass cords describing S-shaped and Z-shaped paths. 3,910,335, Cl. 152-356.000.

Boileau, Jacques, to Compagnie Generale des Etablissements Michelin. Wide radial tire and rim therefor. 3,910,336, Cl. 152-379.000.

Bois, Roger, to Drysys Equipment S.A. Device for producing a constant-level fluidized bed of pulverulent or granular products. 3,909,956, Cl. 34-57.00R.

Bolstad, Gunnar. Device for holding a calendar, a pen and for holding an attachment means for a pad, a writing plate or the like. 3,909,968, Cl. 40-358.000.

Boltze, Karl-Heinz; Brendler, Otfried; Dell, Hans-Dieter; and Jacobi, Haireddin, to Tropenwerke Dinklage & Co. Novel substituted indole compound, process for the preparation and therapeutic compositions containing it. 3,910,952, Cl. 260-326.13R.

Bombardier Limited: *See—*
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Bomer, Bruno: *See—*
Huper, Fritz; Rauenbusch, Erich; Schmidt-Kastner, Gunter; Bomer, Bruno; and Bartl, Herbert, 3,910,825.

Bonin, Jean Claude, to Roto Diesel. Fuel injection pumps for I.C. engines. 3,910,723, Cl. 417-214.000.

Bonner, Joseph A., to Rockwell International Corporation. Angle turbine meter. 3,910,115, Cl. 73-231.00R.

Borg-Warner (Canada) Ltd.: *See—*
Couperus, Egbert; and Janitsch, Anthony D., 3,910,405.

Borisov, Jury Nikolaevich: *See—*
Chemeris, Oleg Nikolaevich; Tretyakov, Evgeny Vasilievich; Didkovsky, Viktor Kirillovich; Kanfer, Vilen Davidovich; Paschenko, Nikolai Konstantinovich; Zeltser, Izmail Grigorievich; Ljukimson, Girgory Mikhailovich; Bashkatov, Alexandr Nikolaevich; Melnikov, Boris Nikolaevich; Medzhibozhsky, Miron Yakovlevich; Goldberg, Ilya Alexandrovich; Juzefovsky, Izrail Abramovich; Ratmansky, Rafail Davidovich; Irkha, Viktor Nikolaevich; Borisov, Jury Nikolaevich; and Kurochkin, Fedor Filippovich, 3,911,175.

Boros, Paul Z.: *See—*
Tregay, John L.; and Boros, Paul Z., 3,911,213.

Borsdorf, Reinhard Alfred; and Crudgington, John Frederick, to C.A.V. Limited. Control circuits for piezoelectric devices. 3,911,298, Cl. 310-8.100.

Bos, Cornelis: *See—*
Holt, Niels Christian; Bos, Cornelis; and Rachlitz, Knud Viggo, 3,910,820.

Boschetto, Carlo: *See—*
Tanferna, Mario; Mascioli, Alessandro; Ciminelli, Angelo; Polo, Franco; and Boschetto, Carlo, 3,910,726.

Boshagen, Horst; and Plempel, Manfred, to Bayer Aktiengesellschaft. Compositions comprising thiocarbamic acid derivatives and method of using same. 3,911,126, Cl. 424-246.000.

Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,910,917.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,911,123.

Botha, A. C., to Raymond Lee Organization, Inc., The, a part interest. Jump-suit style covering garment. 3,909,849, Cl. 2-79.000.

Boulogne, Jean: *See—*
Papantoniou, Christos; and Boulogne, Jean, 3,911,105.

Bouquet, Jean-Claude, to Societe d'Etudes de Machines Thermiques. Pliers for internal combustion engine piston packing-ring. 3,909,903, Cl. 29-224.000.

Bourdereau, Guy Pierre Florentin; and Camboulives, Andre Alphonse Mederic Leon, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Afterburner fuel injection devices for jet engines. 3,910,038, Cl. 60-261.000.

Bourns, Inc.: *See—*
Ragsdale, Charles W.; and Weigl, James, 3,910,261.

Bourseaux, Friedrich: *See—*
Arnold, Herbert; Bourseaux, Friedrich; Potel, Jurgen; and Brock, Norbert, 3,910,982.

Boussois S.A.: *See—*
Adam, Amos, 3,911,357.

Bouwhuis, Gijsbertus, to U.S. Philips Corporation. Optical system for imaging an object, the focussing being maintained independent of a variation in the distance between the object plane and the image plane. 3,911,209, Cl. 178-6.60R.

Bove, Ronald; Kostenko, Alexander, Jr.; and Tkazyik, William J., Jr., to International Business Machines Corporation. Coaxial array space transformer. 3,911,361, Cl. 324-158.00P.

Bowling, Roy E. Alarm detector switch. 3,911,414, Cl. 340-274.000.

Bowman, Edward L., to Phillips Petroleum Company. Aralkyl halide coaccelerator. 3,910,863, Cl. 260-79.50B.

Bowman, Peter; and Kiraly, Ernest F., to Warner-Lambert Company. Adjustable safety razor. 3,909,941, Cl. 30-47.000.

Boy, Charles E., to Connelly Containers, Inc. V-notching machine for corrugated board. 3,910,170, Cl. 93-58.400.

Boylan, John R., to Nupro Company. Metering valve. 3,910,553, Cl. 251-205.000.

Boyle, John J. Exercising device. 3,910,577, Cl. 272-57.00R.

Bracco Industria Chimica, Societa per Azioni: *See—*
Felder, Ernst; and Pitre, Davide, 3,910,989.

Bradley, Wilson E., Jr.; and Schinner, Edward N., to Baltimore Aircoil Company Inc. Control system for injection cooling towers. 3,911,060, Cl. 261-27.000.

Brady, Edward R., to International Telephone and Telegraph Corporation. Transducer. 3,910,106, Cl. 73-88.50R.

Brady, Roscoe O.: *See—*
Pentchev, Peter G.; and Brady, Roscoe O., 3,910,822.

Bramming, Carl, to Aladdin Industries, Inc. Vacuum insulated bottle. 3,910,441, Cl. 215-13.00R.

Brandle, James M.: *See—*
Chen, Tze-ning; Burns, John M.; and Brandle, James M., 3,911,067.

Brasa, Umberto. Transverse frame adjustment means for silk screen printing apparatus. 3,910,185, Cl. 101-124.000.

Brasseries Kronenbourg S.A.: *See—*
Jaegle, Yves Germain, 3,910,172.

Braun, Eric A., to Ex-Cell-O Corporation. Apparatus for closing and sealing containers. 3,910,614, Cl. 53-373.000.

Brayshaw, Stanier E.; and Knapp, Alan J., to General Electric Company. Potential measuring capacitor. 3,911,334, Cl. 317-247.000.

Breen, Joseph: *See—*
Reinhardt, George; Djordjevic, Mihailo; and Breen, Joseph, 3,910,171.

Brefka, Paul E., to Analog Devices, Inc. Method for making cases for panel-mounted electrical instruments. 3,909,908, Cl. 29-417.000.

Brendler, Otfried: *See—*
Boltze, Karl-Heinz; Brendler, Otfried; Dell, Hans-Dieter; and Jacobi, Haireddin, 3,910,952.

Brenman, Henry S.: *See—*
DeFoney, George F.; Mayes, Donald S.; and Brenman, Henry S., 3,911,099.

Brenneman, J. Edward; and Bartram, Nial C., to Schick Incorporated. Combined close shaving and long hair trimming head assembly for an electric shaver. 3,909,938, Cl. 30-34.100.

Breslow, David S., to Hercules Incorporated. Polyfunctional quaternary amidoximidinium salts. 3,910,929, Cl. 260-293.530.

Bretherick, Ormond, to Bohna Engineering & Research Inc. Method for converting ammonium sulfate to ammonium bisulfate. 3,911,092, Cl. 423-520.000.

Brewster, Linda C.: *See—*
Hasegawa, Shin; and Brewster, Linda C., 3,911,103.

Bridgnell, David George; and Jacobsen, Frederick Walter, to Garrett Corporation, The. Heat exchanger mounting device. 3,910,542, Cl. 248-358.0AA.

Brikenshtein, Khaim-Mordkhe Aronovich: *See—*
Belov, Gennady Petrovich; Dzhabiev, Taimuraz Savelievich; Dyachkovsky, Fridrikh Stepanovich; Smirnov, Vyacheslav Ivanovich; Karpova, Nelli Dzhavkharovna; Brikenshtein, Khaim-Mordkhe Aronovich; Gerasina, Matrena Petrovna; Kuzmin, Vladimir Evgenievich; Matkovsky, Petr Evgenievich; Russiyan, Ljudmila Nikolaevna; Pomogailc, Anatoly Dmitrievich; Chirkov, Nikolai Mikhailovich, deceased; and Chirkov, Mikhail Nikolaevich, administrator, 3,911,042.

Brimer, Marshall R.: *See—*
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Brine, William H., Jr. Lacrosse stick. 3,910,578, Cl. 273-96.00D.

Brinkworth, Kenneth John: *See—*
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Bristol-Myers Company: *See—*
Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., 3,910,899.
Menard, Marcel; and Rivest, Pierre, 3,910,920.
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Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, 3,910,900.

British Steel Corporation: *See—*
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Arnold, Herbert; Bourseaux, Friedrich; Potel, Jurgen; and Brock, Norbert, 3,910,982.
Brockman, Larry J., to Nocona Athletic Goods Company. Web for sporting glove. 3,909,848, Cl. 2-19.000.
Brodsky, Larry: *See—*
Jureit, John Calvin; Leutwyler, Roy; Brodsky, Larry; Kushner, Benjamin; and Castillo, Adolfo, 3,910,512.
Brooks, Reginald Gwyn, to Osprey Metals Limited. Method and apparatus for making shaped articles from sprayed molten metal or metal alloy. 3,909,921, Cl. 29-527.200.
Brooks, Robert E.; and Kagiwada, Reynold S., to TRW Inc. Tunable acoustic wave propagation device. 3,911,381, Cl. 333-72.000.
Bross, Charles, Jr.: *See—*
Tinklepaugh, Robert L.; Walters, John D.; Bross, Charles, Jr.; and Lownes, Kenneth, 3,910,765.
Brown, Alfred: *See—*
Wu, Ching H.; Brown, Alfred; and Konopnicki, Daniel T., 3,910,351.
Brown, Brian Edward, to Rank Organisation Limited, The. Electronic apparatus. 3,911,319, Cl. 315-176.000.
Brown, James Harold: *See—*
Crump, Eldon Eugene; and Brown, James Harold, 3,911,388.
Brown, Joe R.; Cochran, Chudleigh B.; and Montgomery, James W., to Brown Oil Tools, Inc. Apparatus and method for cementing well liners. 3,910,349, Cl. 166-153.000.
Brown, Michael A.; and Chiapetta, Frank R., to Pitney-Bowes, Inc. Jogger for plural bin receiver. 3,910,568, Cl. 271-221.000.
Brown Oil Tools, Inc.: *See—*
Brown, Joe R.; Cochran, Chudleigh B.; and Montgomery, James W., 3,910,349.
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Scalza, Anthony J.; and Brown, William G., 3,910,617.
Brown, William R. Method of selectively varying the differential output and overall performance characteristics of a proportional differential pressure producing fluid flow device. 3,910,113, Cl. 73-212.000.
Brown, William W.: *See—*
Frumerman, Robert; and Brown, William W., 3,910,817.
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Browne Engineering Corporation: *See—*
Browne, Kenneth A.; and Browne, Ronald O., 3,910,432.
Browne, Kenneth A.; and Browne, Ronald O., to Browne Engineering Corporation. Apparatus for lifting and loading a load into and out of a vehicle or the like. 3,910,432, Cl. 214-75.00H.
Browne, Ronald O.: *See—*
Browne, Kenneth A.; and Browne, Ronald O., 3,910,432.
Brucker, Henry J.; and Brucker, Robert J., to Kinedyne Corporation. Heavy duty winch for cargo tie-down. 3,910,558, Cl. 254-164.000.
Brucker, John P. Generating screened half-tones by scanning. 3,911,480, Cl. 358-75.000.
Brucker, Robert J.: *See—*
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Brunk, Karl: *See—*
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Brunner, Hans Rudolf: *See—*
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Brunswick Corporation: *See—*
Van Petten, Louis B., 3,910,021.
Bryant, Samuel, Jr. Vertical-tank-type vacuum cleaner. 3,910,781, Cl. 55-305.0BN.
Buchanan, James E., to Westinghouse Electric Corporation. TTL gate voltage controlled crystal oscillator. 3,911,378, Cl. 331-116.00R.
Buchel, Karl Heinz: *See—*
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Buchele, Wesley F., to Iowa State Research Foundation, Inc. Fluid pressure actuated net weighing device with pneumatic taring. 3,910,365, Cl. 177-165.000.
Bucode, Inc.: *See—*
Mosciatti, Roger, 3,910,526.
Buday, Eugene; and Blackman, Sol. Hot food merchandiser. 3,911,248, Cl. 219-400.000.
Budreau, Alan J.: *See—*
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Buhler, Otto R.; Cutter, Joseph T.; Mantey, John P.; and Wood, David R., to International Business Machines Corporation. Web distribution controlled servomechanism in a reel-to-reel web transport. 3,910,527, Cl. 242-186.000.
Buildex Incorporated: *See—*
Struble, Robert W.; and Eckstine, John T., 3,910,782.
Buisine, Abel; and de Torsiac, Renaud, to La Cellophane. Imidazole couplers for two component diazotype systems. 3,910,794, Cl. 96-91.00R.
Bullard, Herbert L.: *See—*
Osborn, Robert A.; and Bullard, Herbert L., 3,910,865.
Bunker Ramo Corporation, The: *See—*
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Bunnell, Edward Dennman: *See—*
Aldridge, Lionel Dennis; and Bunnell, Edward Dennman, 3,909,935.
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Burger, Wolfgang; and Vollmeyer, Werner, to Siemens Aktiengesellschaft. Circuit arrangement for subscriber stations in telecommunications installations, especially telephone installations with auxiliary data traffic. 3,911,223, Cl. 179-2.0DP.
Burlingame, Glen E. Combination changing cylinder lock. 3,910,083, Cl. 70-383.000.
Burns, John M.: *See—*
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Burns, Richard H.; Hosack, Donald R.; and Welker, Helmut, to Bausch & Lomb Incorporated. Measuring apparatus using the moire fringe concept of measurement. 3,910,703, Cl. 356-169.000.
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Burrows, Sherman D. Apparatus for sterilizing meat products and method of using same. 3,910,176, Cl. 99-477.000.
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Buschman, Jerome, to McGraw-Edison Company. Powered cutter with snubber drive means. 3,909,943, Cl. 30-216.000.
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Paton, Boris Evgenievich; Kudinov, Vladimir Mikhailovich; Bushtedt, Jury Petrovich; Petushkov, Vladimir Georgievich; Volgin, Leonid Alexandrovich; Pogoretsky, Georgy Ivanovich; and Sukhikh, Leonid Leonidovich, 3,910,084.
Busse, Wolfgang; Du Mont, Hans-Christoph; Klotzner, Winfried; Gloss, Erwin; and Daumer, Rolf, to Robert Bosch G.m.b.H. Transducer controlled oscillator system. 3,911,374, Cl. 331-65.000.
Butler, Gene R.; Butler, Lee D.; and Darnall, David L., to Sperry Rand Corporation. Machine for forming a compact stack of crop material. 3,910,018, Cl. 56-350.000.
Butler, Lee D.: *See—*
Butler, Gene R.; Butler, Lee D.; and Darnall, David L., 3,910,018.
Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Reiner; and Kugler, Florian, to Jenoptik Jena G.m.b.H. IIIa - Vb Type luminescent diodes. 3,911,462, Cl. 357-17.000.
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Borsdorf, Reinhard Alfred; and Crudgington, John Frederick, 3,911,298.
Skinner, Robert Thomas John, 3,910,244.
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Calcagno, Benedetto: *See—*
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Bourdereau, Guy Pierre Florentin; and Camboulives, Andre Alphonse Mederic Leon, 3,910,038.
Cameron, Frank L.: *See—*
Blewitt, Donald D.; Cameron, Frank L.; and Vondracek, Charles H., 3,911,385.
Camras, Marvin, to Illinois Institute of Technology. Flutter reducing tape drive mechanism, particularly for video reading devices. 3,911,493, Cl. 360-90.000.
Canadian Patents and Development Limited: *See—*
Smirnoff, Wladimir A., 3,911,110.
Candy, James Charles; and Lukacs, Michael Edward, to Bell Telephone Laboratories, Incorporated. Current bootstrap to reduce interelectrode capacitance effect in a vacuum tube. 3,911,317, Cl. 315-30.000.
Canfield, Allen B., to Rexham Corporation. Machine for establishing a controlled atmosphere in packages. 3,910,009, Cl. 53-112.00B.
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Kondo, Eiichi; and Inoue, Shozo, 3,910,232.
Okuno, Youichi, 3,911,457.
Sone, Yoshiaki; and Kashiwagi, Kazuo, 3,910,698.
Cantales, Joseph. Combination can-opener tool. 3,909,860, Cl. 7-14.250.
Canup, Robert E., to Texaco Inc. Continuous-wave high-frequency AC ignition system. 3,910,246, Cl. 123-148.00E.

Capozza, Richard Carl, to American Cyanamid Company. Medicament carrier. 3,911,098, Cl. 424-22.000.

Carborundum Company, The: *See*—
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Cardinal Insulated Glass Co.: *See*—
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Cardon, Bartley P., to Arizona Feeds. Composition and method for treating stressed ruminants. 3,911,114, Cl. 424-128.000.

Caretta, Renato, to Industrie Pirelli, S.p.A. Apparatus for molding and curing a pneumatic tire in a perfectly centered position with respect to the equatorial plane of the curing mold. 3,910,735, Cl. 425-46.000.

Carevello, Ronald G.: *See*—
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Carl Hurth, Maschinen- und Zahnradfabrik: *See*—
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Carl Zeiss-Stiftung: *See*—
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Carlson, Daniel P.; and Hardin, James T., to Eltra Corporation. Switching type motor speed control. 3,911,341, Cl. 318-341.000.

Carnes, Donald W.: *See*—
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Carnes, James Edward: *See*—
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Carney, William V.: *See*—
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Carter, Cecil O., to Phillips Petroleum Company. Removal of propane from alkylation effluent without loss of ethyl fluoride. 3,911,044, Cl. 260-683.480.

Carter, Ivor W.: *See*—
Gau, Leonard P.; Riley, Donald E.; and Carter, Ivor W., 3,910,243.

Cartwright, Terrence; Schwartz, Alan Asher; and Smith, William Roy, to G. D. Searle & Co. Interferon assay. 3,910,824, Cl. 195-103.50R.

Cascade Industries, Incorporated: *See*—
Adam, Charles R., 3,910,840.

Casciano, Frederick M., to University of Hawaii. Loose material recovery system having a mixing box. 3,909,960, Cl. 37-63.000.

Cashen, Norton A.: *See*—
Reinhardt, Robert M.; Cashen, Norton A.; and Reeves, Wilson A., 3,909,861.

Cashin Systems Corporation: *See*—
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Caskey, Terry L.; and Lindblom, Robert O., to Dow Chemical Company, The. Plastic oxygen barriers. 3,911,184, Cl. 428-35.000.

Castagna, Eugene G.; Perron, Peter J.; and Christensen, Ronald I., to Dart Industries Inc. Block copolymers of ethylene and propylene and process for their manufacture. 3,911,052, Cl. 260-878.00B.

Castanoli, Alder F. Multiple pass drying apparatus. 3,909,958, Cl. 34-166.000.

Castillo, Adolfo: *See*—
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Catanzarite, Vincent Owen, to Specialty Products Development Corporation. Low temperature gas generating compositions. 3,910,805, Cl. 149-83.000.

Caterpillar Tractor Company: *See*—
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Cavalla, John Frederick; and Archibald, John Leheup, to John Wyeth & Brother Limited. 1-(Naphthylalkyl- or indenylalkyl)-piperidines. 3,910,931, Cl. 260-293.620.

Cavalla, John Frederick; and Archibald, John Leheup, to John Wyeth & Brother Limited. 1-Pyridylalkyl piperidines. 3,910,932, Cl. 260-293.690.

Cederstrand, Carl N.; and Keenan, Charles A., to Beckman Instruments, Inc. Dual lighthouse detector. 3,911,277, Cl. 250-345.000.

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Central Welding Supply Co.: *See*—
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Champlin, H. H.: *See*—
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Chance, Leon H.; and Moreau, Jerry P., to United States of America, Agriculture. Organo-phosphorus compounds containing perfluoroalkyl radicals and aziridine radicals. 3,910,886, Cl. 260-239.0EP.

Chandler, Jack A.; and de Kanter, Hendrick. Concrete finishing roller. 3,910,738, Cl. 425-162.000.

Chang, Sanlu Y.: *See*—
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Chang, Wen Hsing; and Lee, Hsing-San, to International Business Machines Corporation. Nonvolatile semiconductor memory. 3,911,464, Cl. 357-23.000.

Chao, Albert L. Lighted ring toy. 3,911,264, Cl. 240-6.40R.

Chapman, Charles C., to Phillips Petroleum Company. Apparatus for contacting HF alkylate containing alkyl fluoride with additional HF catalyst to convert alkyl fluoride to additional alkylate. 3,910,771, Cl. 23-288.00E.

Chapman, Norman Bellamy; Clarke, Kenneth; Iddon, Brian; James, John William; and Hedge, Maurice John, to Aspro-Nicholas Limited. Benzothiophene-ethylamines. 3,910,955, Cl. 260-330.500.

Charles-Massance, Francois, to Lacelluphane. Process for inverting flow in a conduit. 3,911,073, Cl. 264-171.000.

Charpentier, Jean G., to Societe Anonyme dite: S.I.E.T.A.M. Overhead conveyor. 3,910,197, Cl. 104-89.000.

Cheatham, Donald C.; and Reid, Richard, to United States of America, General Counsel-Code GP. Spacecraft docking and alignment system. 3,910,533, Cl. 244-161.000.

Chemeris, Oleg Nikolaevich; Tretyakov, Evgeny Vasilievich; Didkovsky, Viktor Kirillovich; Kanfer, Vilen Davidovich; Paschenko, Nikolai Konstantinovich; Zeltser, Izmail Grigorievich; Ljukimson, Girgory Mikhailovich; Bashkatov, Alexandr Nikolaevich; Melnikov, Boris Nikolaevich; Medzhibozhsky, Miron Yakovlevich; Goldberg, Ilya Alexandrovich; Juzefovsky, Izrail Abramovich; Ratmansky, Rafail Davidovich; Irkha, Viktor Nikolaevich; Borisov, Jury Nikolaevich; and Kurochkin, Fedor Filippovich. Method and a device for gunniting converter. 3,911,175, Cl. 427-233.000.

Cheminees Richard le Droff S.A.: *See*—
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Chemtob, Elie M.: *See*—
Garrett, Donald E.; Kallerud, Mauritz J.; and Chemtob, Elie M., 3,910,773.

Chen, Tze-ning; Burns, John M.; and Brandle, James M., to Ingersoll-Rand Company. Direct contact gas condenser. 3,911,067, Cl. 261-113.000.

Chernock, Stephen P. Spark wheels, method of manufacturing spark wheels, and dies for use therein. 3,910,751, Cl. 431-273.000.

Chetwynd, Derek Gordon: *See*—
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Chevron Research Company: *See*—
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Chiapetta, Frank R.: *See*—
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Chichester, Willard L.; and Holtkamp, Donald A., to Clark Equipment Company. Hydrostatic transmission system for articulated vehicle. 3,910,369, Cl. 180-44.00F.

Chichester, Willard L.: *See*—
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Child, James Richard: *See*—
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Childress, Albert J. Safety guard for well drilling apparatus. 3,910,359, Cl. 173-165.000.

Chin, William Benedict, to International Business Machines Corporation. Decode circuit. 3,911,428, Cl. 340-347.0DD.

Chinuki, Takashi: *See*—
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Chirkov, Mikhail Nikolaevich, administrator: *See*—
Belov, Gennady Petrovich; Dzhabiev, Taimuraz Savelievich; Dyachkovsky, Fridrikh Stepanovich; Smirnov, Vyacheslav Ivanovich; Karpova, Nelli Dzhavkharovna; Brikenshtein, Khaim-Mordkhe Aronovich; Gerasina, Matrena Petrovna; Kuzmin, Vladimir Evgenievich; Matkovsky, Petr Evgenievich; Russiyan, Ljudmila Nikolaevna; Pomogailc, Anatoly Dmitrievich; Chirkov, Nikolai Mikhailovich, deceased; and Chirkov, Mikhail Nikolaevich, administrator, 3,911,042.

Chirkov, Nikolai Mikhailovich, deceased: *See*—
Belov, Gennady Petrovich; Dzhabiev, Taimuraz Savelievich; Dyachkovsky, Fridrikh Stepanovich; Smirnov, Vyacheslav Ivanovich; Karpova, Nelli Dzhavkharovna; Brikenshtein, Khaim-Mordkhe Aronovich; Gerasina, Matrena Petrovna; Kuzmin, Vladimir Evgenievich; Matkovsky, Petr Evgenievich; Russiyan, Ljudmila Nikolaevna; Pomogailc, Anatoly Dmitrievich; Chirkov, Nikolai Mikhailovich, deceased; and Chirkov, Mikhail Nikolaevich, administrator, 3,911,042.

Chisum, Finis Lavell. Wrenchless trailer to cab connector. 3,910,606, Cl. 280-425.00A.

Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Benzodioxane derivatives. 3,910,893, Cl. 260-240.00R.

Chodnekar, Madhukar Subraya; Loeliger, Peter; Pfiffner, Albert; Schwieter, Ulrich; Suchy, Milos; and Zurflueh, Rene, to Hoffmann-La Roche Inc. Pest retardants. 3,910,897, Cl. 260-240.00H.

Chonekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Benzodioxane derivatives. 3,910,892, Cl. 260-240.00R.

Chopra, Inder J., to Professional Staff Association of the Los Angeles County Harbor General Hospital. Radioimmunoassay for measurement of thyroxine (T_4) and triiodothyonine (T_3) in blood serum. 3,911,096, Cl. 424-1.000.

Christensen, Ronald I.: *See*—
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Christopherson, Herman P.: *See*—
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Christy, Charles B.; and Long, Roger D., to Eaton Corporation. Detent door holder. 3,909,877, Cl. 16-85.000.

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Chrysler Corporation: *See—*
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Ciba-Geigy AG: *See—*
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Ciba-Geigy Corporation: *See—*
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Cincinnati Mine Machinery Company, The: *See—*
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Citizen Watch Co., Ltd.: *See—*
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Claeys, Daniel Alois: *See—*
Janssens, Wilhelmus; Claeys, Daniel Alois; Lemahieu, Raymond Gerard; and Dierckx, Jozef Aime, 3,911,171.

Clark, Daniel J., to Stalker Corporation, The. Method of fabricating a heat exchanger core. 3,909,901, Cl. 29-157.30D.

Clark Equipment Company: *See—*
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Gibson, Ira J., 3,910,041.
Holtkamp, Donald A.; and Chichester, Willard L., 3,910,440.

Clark, Justin S.; and Veasy, Lloyd George, to Primary Childrens' Hospital. Automated blood analysis system. 3,910,256, Cl. 128-2.00G.

Clark, Leland C., Jr., to Children's Hospital, Inc., of Cincinnati, Ohio. Artificial blood and method for supporting oxygen transport in animals. 3,911,138, Cl. 424-352.000.

Clark, Lowell E., to Motorola, Inc. Semiconductor device with improved reverse transient capability. 3,911,461, Cl. 357-13.000.

Clarke, Kenneth: *See—*
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Cleland, Robert L.: *See—*
Graham, Alexander L.; and Cleland, Robert L., 3,910,564.

Clerk, Robert Cecil. Hydraulic transmission control system. 3,910,043, Cl. 60-413.000.

Cleveland, Garry J.: *See—*
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Cleveland Hardware & Forging Co.: *See—*
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Clifton, Jack K.: *See—*
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Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. High velocity thermal migration method of making deep diodes. 3,910,801, Cl. 148-1.500.

Clowers, Earl R.; Azelkas, Walter G.; and Carnes, Donald W., to Singer Company, The. Vacuum cleaner with nozzle height adjusting mechanism. 3,909,874, Cl. 15-339.000.

Coal Industry (Patents) Limited: *See—*
Highley, John, 3,910,235.

Coburn, Leslie O.; and Farfaglia, Silvio T., to Phillips Petroleum Company. Coated mandrel for carton forming machine. 3,910,169, Cl. 93-39.200.

Cochran, Chudleigh B.: *See—*
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Cockerill-Ougree-Providence et Esperance-Longdoz en Abrege "Cockerill": *See—*
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Coe, William H., to Keystone Consolidated Industries, Inc. Cabinet spring latch. 3,910,614, Cl. 292-219.000.

Coenen, Renier Gertruda Hubertus; Leummens, Karel Martin Hubert; and Swaving, Erland Charles Justus, to U.S. Philips Corporation. Oxide cathode for an electric discharge tube. 3,911,312, Cl. 313-346.00R.

Coes, Loring, Jr., to Norton Company. Process for making sintered abrasive grains. 3,909,991, Cl. 51-309.000.

Cogbill, Philip H., II: *See—*
Hammersmith, James R.; and Cogbill, Philip H., II, 3,910,288.

Cohen, Arthur I.: *See—*
Sim, James S. Y.; Van Horn, Maurice H.; Cohen, Arthur I.; Gordesky, Stanley E.; and Gordon, Stanley I., 3,911,100.

Coleman, Martin Richard. Hygienic device. 3,910,265, Cl. 128-66.000.

Colgate-Palmolive Company: *See—*
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Harrison, Michael, 3,911,104.

Colglazier, Donald F.; and Westphal, Gordon W., to International Business Machines Corporation. Apparatus for print head retraction to facilitate paper insertion. 3,910,395, Cl. 197-1.00R.

Collar, Roland W., to Roean Industries. Air actuated plastic compound dispensing device. 3,910,466, Cl. 222-327.000.

Collins, John J.: *See—*
Huelskamp, Henry J.; Collins, John J.; and Devero, James E., 3,911,142.

Colmey, John C.; and Henselman, Marlene R., to Foremost-McKesson, Inc. Substitute product for nonfat dry milk and method for forming. 3,911,143, Cl. 426-583.000.

Colombo, Winifred M.: *See—*
Dootson, Norman L., 3,909,939.

Colon, George M., to Data Entry Systems. Appliance for punching record cards. 3,910,473, Cl. 225-93.000.

Colwell, William C., Jr.: *See—*
Hurst, George S.; and Colwell, William C., Jr., 3,911,215.

Comalco (J. & S.) Pty. Limited: *See—*
Jury, Harold Rex; and Howells, Ronald McKenzie, 3,910,092.

Combustion Engineering, Inc.: *See—*
Bevilacqua, Frank, 3,910,447.

Comer, William Timmey: *See—*
Kreighbaum, William Eugene; and Comer, William Timmey, 3,910,927.

Comfax Communications, Inc.: *See—*
Tregay, John L.; and Boros, Paul Z., 3,911,213.

Comitato Nazionale Per L'Energia Nucleare & Chen: *See—*
Tabacchi, Giuseppe, 3,910,585.

Commercial Solvents Corporation: *See—*
Hunsucker, Jerry H., 3,910,971.
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Commissariat a l'Energie Atomique: *See—*
Dejachy, Jacques; and Gillardeau, Jacques, 3,911,194.
Marc Conraux, Claude Charles; Despringre, Alain; Kaphan, Gerard; and Max, Jacques, 3,911,329.

Compagnie Generale de Geophysique: *See—*
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Compagnie Generale des Etablissements Michelin: *See—*
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Boileau, Jacques, 3,910,336.

Compagnie Honeywell Bull: *See—*
Laboue, Bernard Andre; and Qu'Hen, Rene, 3,910,537.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Mignon, Guy, 3,911,225.

Conduco AG: *See—*
Mehnert, Gottfried, 3,910,741.

Connelly Containers, Inc.: *See—*
Boy, Charles E., 3,910,170.

Connors, Frank T., to Symons Corporation. She-bolt type gripper device for a concrete wall form tie rod. 3,910,546, Cl. 249-40.000.

Conshohocken Chemicals, Inc.: *See—*
Lederman, Burton E.; and Reilly, John J., 3,910,852.

Continental Can Company, Inc.: *See—*
Hoenig, James Robert; and Mallorca, Salvador Cariasa, 3,910,213.
Novak, James B. W., 3,910,454.
Reinhardt, George; Djordjevic, Mihailo; and Breen, Joseph, 3,910,171.
Shaw, Fred B., 3,910,410.

Conzemius, Robert J., to United States of America, Energy Research & Development Administration. Ion illumination angle control for a mass spectrometer. 3,911,272, Cl. 250-281.000.

Cook, Edward J., to Tele-Sensors, Inc. Data transmission system employing a harmonic transponder including means for varying phase in response to surrounding conditions. 3,911,434, Cl. 343-6.50R.

Cook, Niel V. Compact clothing hanging device. 3,910,417, Cl. 211-89.000.

Cooke, Victor F. G.; and Duquin, James A., to Hooker Chemicals & Plastics Corporation. Fire retardant polyesters. 3,911,050, Cl. 260-869.000.

Coombs, Robert V.; and Hardtmann, Goetz E., to Sandoz, Inc. Treating lipidemia with 1-tertiary-butyl-3-aryl-2,1-benzisoxazolines and compositions therefor. 3,911,132, Cl. 424-272.000.

Coon, Marvin D., to Chevron Research Company. Reaction products of formals, acetals and ketals with succinic acid or anhydride as lubricating oil and fuel additives. 3,910,845, Cl. 252-56.00R.

Cooper, William D., to Goodyear Tire & Rubber Company, The. Process for the preparation of dialkylbenzene dihydroperoxide. 3,911,020, Cl. 260-610.00B.

Copeland, Gregory D., to Shakespeare of Arkansas, Inc. Free spool mechanism. 3,910,528, Cl. 242-216.000.

Copeland, Leigh. Stringed musical instrument. 3,910,151, Cl. 84-267.000.

Corcoran, Vincent J.: *See—*
Rushworth, Paul M.; McMillan, Robert W.; and Corcoran, Vincent J., 3,910,679.

Cords, Donald Philip, to Du Pont de Nemours, E. I., and Company. Dry planographic printing plate. 3,910,187, Cl. 101-450.000.

Corll, James A., to Particle Technology, Inc. Apparatus for detecting particles employing apertured light emitting device. 3,910,702, Cl. 356-72.000.

Corning Glass Works: *See—*
Dumbaugh, William H., Jr., 3,911,275.
Messing, Ralph A., 3,910,823.
Messing, Ralph A., 3,910,851.

Cornish, Robert F.; and Popa, Daniel E., to Timken Company, The. Method of retaining an inner part within the bore of an outer part. 3,909,920, Cl. 29-522.000.
Corson, Steve. Marine engine with remotely located electrical components. 3,910,220, Cl. 115-.50R.
Cory, Robert Paul, to CPC International Inc. Enzymatic isomerization product. 3,910,821, Cl. 195-31.00F.
Cossuta, Giuseppe: *See—*
Murari, Bruno; Cossuta, Giuseppe; and Orsucci, Sergio, 3,911,327.
Cottone, Sam J.; and Futia, Leonard F., to Marvin Glass & Associates. Light bulb socket. 3,910,674, Cl. 339-180.000.
Couperus, Egbert; and Janitsch, Anthony D., to Borg-Warner (Canada) Ltd. Conveyor apparatus. 3,910,405, Cl. 198-163.000.
Courtney, William B.; and Fox, Edward I., to H. W. Crane Company. Door operating mechanism. 3,909,980, Cl. 49-199.000.
Cowley, Ronald W.; Hallwood, Reginald; and Lockwood, Norman, to John Poulten Limited. Plugging machines. 3,910,010, Cl. 53-115.000.
CPC International Inc.: *See—*
Cory, Robert Paul, 3,910,821.
CPT Corporation: *See—*
Spence, Gary W.; Wienhold, James L.; and Kveberg, Larry E., 3,911,489.
Crabtree, Eleanor V.: *See—*
Poziomek, Edward J.; Crabtree, Eleanor V.; and Kramer, David N., 3,910,763.
Crafoord, Carl-Goran: *See—*
Groby, Chester; Crafoord, Carl-Goran; and Grieves, John, 3,910,800.
Craft, Michael E., to Motorola, Inc. Isolated contact. 3,911,472, Cl. 357-51.000.
Crandell, William H.; Lisenbee, Wayne F.; and Nelson, Keith E., to Dynatech Corporation. Cryosurgical probe. 3,910,278, Cl. 128-303.100.
Crawford, Joseph A.; and Abrahams, Fred, to Advance Transformer Company. Multiple lighting level ballast for fluorescent lamps. 3,911,320, Cl. 315-240.000.
Crepaco, Inc.: *See—*
Wakeman, Alden H., 3,910,177.
Croix, Louise S. Fluorinated isopropyl derivatives. 3,911,024, Cl. 260-614.00F.
Cross, Peter E.; Stichbury, James R.; Thorpe, Eric F.; and Scollick, Neil M., to Pfizer Inc. Substituted phenoxyalkylamines as gastric anti-secretory agents. 3,910,896, Cl. 260-240.00R.
Crotti, Renato. Apparatus for producing a coiled thread package. 3,909,892, Cl. 28-21.000.
Crown Cork & Seal Company, Inc.: *See—*
Kneusel, Raymond H. P.; and Potts, Vinson S., 3,910,453.
Crudgington, John Frederick: *See—*
Borsdorf, Reinhard Alfred; and Crudgington, John Frederick, 3,911,298.
Crump, Eldon Eugene; and Brown, James Harold, to Houston Products and Services, Inc. Accelerometer. 3,911,388, Cl. 340-17.000.
Csanady, Michael, Jr.; and Burckhalter, Frank O., to Westinghouse Electric Corporation. Lubricating oil system integral with structural steel turbine foundation. 3,910,381, Cl. 184-6.000.
Cullen, William P.: *See—*
Hellmuth, Walter W.; Chafetz, Harry; and Cullen, William P., 3,910,844.
Cummings, Jerry D.; and Paulovich, John M., to Airwick Industries, Inc. Dispensing container for solid air-treating gel. 3,910,495, Cl. 239-58.000.
Cummings, William M., to Texaco Inc. Nitroalkyl nitrates. 3,910,981, Cl. 260-453.00R.
Cummings, William M., to Texaco Inc. Substituted nitroalkyl peroxynitrate. 3,910,987, Cl. 260-476.00R.
Cummins Engine Company, Inc.: *See—*
Neff, Robert L.; Mote, Charles R.; and McNaulty, James E., 3,909,916.
Cunningham, Hugh: *See—*
Raetzsch, Carl W.; Van Hoozer, John F.; and Cunningham, Hugh, 3,910,827.
Curchod, Donald B.; and Madden, Allan C., to Nortron Corporation. Dynamic balancing machine. 3,910,121, Cl. 73-462.000.
Curtis, Bernard John; and Brunner, Hans Rudolf, to RCA Corporation. Method for vapor-phase growth of thin films of lithium niobate. 3,911,176, Cl. 427-248.000.
Cutler, Lloyd R. One-piece adhesively secured anchor. 3,910,539, Cl. 248-205.00A.
Cutter, Joseph T.: *See—*
Buhler, Otto R.; Cutter, Joseph T.; Mantey, John P.; and Wood, David R., 3,910,527.
Dahlem, Francis E.: *See—*
Ireland, Roy D., Jr.; and Dahlem, Francis E., 3,911,066.
Dainichi-Nippon Cables, Ltd.: *See—*
Fujita, Hideo; Hachisuka, Kozo; Furukawa, Kiyoshi; Matsutani, Tsutomu; Kobayashi, Kei; Yonekura, Shiro; Takano, Akiyoshi; and Nakazawa, Hiroshi, 3,911,069.
Dainippon Ink & Chemicals Inc.: *See—*
Arai, Yoshi; Kinoshita, Shoichi; and Kimura, Kazuo, 3,910,682.
Kataoka, Akihiko, 3,910,826.
Dainippon Ink Institute of Chemical Research: *See—*
Arai, Yoshi; Kinoshita, Shoichi; and Kimura, Kazuo, 3,910,682.
Daiwa Seiko Co., Ltd.: *See—*
Fujita, Takeshi, 3,910,394.
D'Amato, Salvatore F.; and Foote, Chauncey P., Jr., to American Bank Note Company. Ink supply apparatus for intaglio printing press. 3,910,186, Cl. 101-156.000.
Danberg, Victor. Solid waste chopper of rotary type. 3,910,510, Cl. 241-189.00R.
Danford, Jack DeWayne, to Danford, Jack DeWayne; and Champlin, H. H., part interest to each. Gang hitching apparatus. 3,910,605, Cl. 280-415.00R.
Daniels, Douglas William: *See—*
Pearce, Bryan Robert; and Daniels, Douglas William, 3,910,651.
Dare, Sherman E., to United States of America, Navy. Hand-held signaling device having manual firing means. 3,910,190, Cl. 102-37.400.
Darnall, David L.: *See—*
Butler, Gene R.; Butler, Lee D.; and Darnall, David L., 3,910,018.
Darrieussecq, Jean-Pierre: *See—*
Lasserre, Roger; and Darrieussecq, Jean-Pierre, 3,909,983.
Dart Industries Inc.: *See—*
Castagna, Eugene G.; Perron, Peter J.; and Christensen, Ronald I., 3,911,052.
Fein, Marvin Michael, 3,910,976.
Data Entry Systems: *See—*
Colon, George M., 3,910,473.
Datow, Joachim: *See—*
Merkel, Karl; Datow, Joachim; Paetsch, Juergen; Hoffmann, Herwig; and Winderl, Siegfried, 3,910,983.
Daugherty, John W.: *See—*
Gelin, Robert J.; Stotler, David V.; and Daugherty, John W., 3,910,513.
Daumer, Rolf: *See—*
Busse, Wolfgang; Du Mont, Hans-Christoph; Klotzner, Winfried; Gloss, Erwin; and Daumer, Rolf, 3,911,374.
Davies, David Harris, to British Steel Corporation. Apparatus and method for ultrasonic testing. 3,910,104, Cl. 73-67.80S.
Davis, Jefferson C., Jr.: *See—*
Eckhaus, Sigmund R.; Davis, Jefferson C., Jr.; Zeffert, Bernard M.; and Moore, Thomas R., 3,911,059.
Davis, Joseph, to Carborundum Company, The. Method for installing furnace linings. 3,909,907, Cl. 29-407.000.
Davis, Paul Cooper; and Embree, Milton Luther, to Bell Telephone Laboratories, Incorporated. Driver circuit for high speed gating of a field effect transistor. 3,911,294, Cl. 307-251.000.
Davis, William Folsom, to Motorola, Inc. Capacitance multiplier circuit. 3,911,296, Cl. 307-297.000.
Dawson, Graham Robert: *See—*
Biddell, David Colin; Dawson, Graham Robert; and Sansome, Dennis Hugh, 3,910,085.
Day, Charles L. Heating device for molding. 3,911,251, Cl. 219-523.000.
DDS-Kroyer A/S: *See—*
Holt, Niels Christian; Bos, Cornelis; and Rachlitz, Knud Viggo, 3,910,820.
De La Cierva, Juan J. Gyroscopic image motion compensator for a motion picture camera. 3,910,693, Cl. 352-244.000.
Dealers Truck Equipment Inc.: *See—*
Becker, Robert L., 3,910,624.
Dean, Donald E.; and Alesi, John, Jr., to Formex Manufacturing, Inc. Apparatus having improved sheet clamping means for forming plastic sheets. 3,910,747, Cl. 425-397.000.
Dean, George A., to Dean Research Corporation. Routing and conveying apparatus. 3,910,402, Cl. 198-38.000.
Dean Research Corporation: *See—*
Dean, George A., 3,910,402.
Debesis, John R., to General Electric Company. Method of making contacts to semiconductor light conversion elements. 3,909,929, Cl. 29-590.000.
Debus, Alfred, to Theodor Grabener Maschinenfabrik. Coining press. 3,910,096, Cl. 72-344.000.
DeClaire, Gerald, to Rockwell International Corporation. Wheel speed sensor module assembly. 3,911,302, Cl. 310-168.000.
de Crepy, Edouard, to Societe Anonyme Francaise des Appareils Automatiques, Taximetres-Taxiphones "SAFAA". Coil telephone anti-jimmy cabinet. 3,910,393, Cl. 194-1.00B.
Deeren, Thomas J., to Owens-Illinois, Inc. Package assembly. 3,910,411, Cl. 206-422.000.
Deering Milliken Research Corporation: *See—*
Holliday, Bettie E., 3,910,075.
DeFeo, John J., to American Sterilizer Company. Power operator for elevator shaft doors. 3,910,384, Cl. 187-52.0LC.
DeFoney, Brenman, Mayes & Baron: *See—*
DeFoney, George F.; Mayes, Donald S.; and Brenman, Henry S., 3,911,099.
DeFoney, George F.; Mayes, Donald S.; and Brenman, Henry S., to DeFoney, Brenman, Mayes & Baron. Long-acting articles for oral delivery and process. 3,911,099, Cl. 424-28.000.
DeFrees, Joseph H. Internal emergency valve for storage tank. 3,910,551, Cl. 251-144.000.
Dehm, Henry C.; and Tew, Burton E., Jr., to Hercules Incorporated. Projectile rotating band. 3,910,194, Cl. 102-93.000.
Dejachy, Jacques; and Gillardeau, Jacques, to Commissariat a l'Energie Atomique. Method for forming pure metal or non-metal deposits. 3,911,194, Cl. 428-408.000.
DeJager, Donald, to Eastman Kodak Company. Three element objective lens with aspheres on rear surfaces of first and second elements. 3,910,685, Cl. 350-226.000.

de Kanter, Hendrick: *See—*
Chandler, Jack A.; and de Kanter, Hendrick, 3,910,738.

Del Bon, Franco, to Trisa Burstenfabrik AG. Cartridge for liquid or pasty dentifrice. 3,910,706, Cl. 401-134.000.

Dell, Hans-Dieter: *See—*
Boltze, Karl-Heinz; Brendler, Otfried; Dell, Hans-Dieter; and Jacobi, Haireddin, 3,910,952.

DeLuca, John C.: *See—*
Argyle, Bernell E.; and DeLuca, John C., 3,911,411.

De Luca, Paul V.; Carney, William V.; and Carevello, Ronald G., to Porta Systems Corporation. Modular jack strip assembly. 3,911,229, Cl. 179-97.000.

DeMaria, Anthony J.; and Mack, Michael E., to United Technologies Corporation. Optically pumped laser systems. 3,911,375, Cl. 331-94.50P.

Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, to Ayerst, McKenna and Harrison Ltd. Oxazinoindole- and thiazinoindole derivatives. 3,910,901, Cl. 260-243.00R.

Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, to Ayerst, McKenna and Harrison Ltd. Oxazinoindole- and thiazinoindole derivatives. 3,910,903, Cl. 260-243.00R.

Demerson, Christopher A.: *See—*
Jirkovsky, Ivo; Humber, Leslie G.; Demerson, Christopher A.; and Dobson, Thomas A., 3,910,954.

Demircioglu, Sayman Fadil: *See—*
Arndt, Horst; and Demircioglu, Sayman Fadil, 3,911,423.

Denenburg, Richard L. Transportation system. 3,910,196, Cl. 104-20.000.

Denler, Harry Kirk, to Grip-It, Inc. Hand exerciser with adjustable valve. 3,910,572, Cl. 272-68.000.

Derbyshire, George C., to Jacobs Manufacturing Co., Ltd., The. Electrically insulated drill chuck for portable electric power drills. 3,910,589, Cl. 279-61.000.

Derner, William J.: *See—*
Price, Connor E.; Pfaffenberger, Eugene E.; and Derner, William J., 3,910,656.

Despringre, Alain: *See—*
Marc Conraux, Claude Charles; Despringre, Alain; Kaphan, Gerard; and Max, Jacques, 3,911,329.

Desrochers, Clement J.: *See—*
Raby, Raymond; and Desrochers, Clement J., 3,910,836.

Dester, Delbert D.: *See—*
Boggs, Roger L.; and Dester, Delbert D., 3,910,128.

de Torsiac, Renaud: *See—*
Buisine, Abel; and de Torsiac, Renaud, 3,910,794.

Detty, Rodney H.; and Leichliter, Wayne K., to Eaton Corporation. Pulley assembly. 3,910,391, Cl. 192-58.00B.

Deucher, Joseph S.: *See—*
Willison, Donald; Weber, Hans B.; and Deucher, Joseph S., 3,910,655.

Deutsch, Ralph; and Griffith, Glen R., to Nippon Gakki Seizo Kabushiki Kaisha. Implementation of octave repeat in a computor organ. 3,910,150, Cl. 84-1.030.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Klingler, Karl Heinz; and Habersang, Silke, 3,911,016.

Deutsche Gold- und Silber-Schneideanstalt vormals Roessler: *See—*
Von Bebenburg, Walter, 3,910,887.

Devero, James E.: *See—*
Huelskamp, Henry J.; Collins, John J.; and Devero, James E., 3,911,142.

Dewaele, Sylvain A. R.: *See—*
Dulog, Lothar G.; and Dewaele, Sylvain A. R., 3,910,905.

Dewar, David Mason; and Finch, Peter Dosell, to Sperry Rand Corporation. Compass systems. 3,911,255, Cl. 235-150.250.

Deysel, Christoffel Johannes, to Deysel 32 Implemente Limited. Seed extracting means for planters. 3,910,456, Cl. 221-254.000.

Deysel 32 Implemente Limited: *See—*
Deysel, Christoffel Johannes, 3,910,456.

Dhami, Kewal Singh: *See—*
Aronoff, Elihu J.; and Dhami, Kewal Singh, 3,911,192.

Diamond Shamrock Corporation: *See—*
Singh, Vipin K., deceased, 3,911,108.

Diax Corporation: *See—*
Bell, William E., 3,911,276.

Dick, John O.; and Billings, John C., Jr., to United States of America, Navy. Fuze signal processing circuit. 3,910,192, Cl. 102-70.20P.

Dickore, Karlfried: *See—*
Draber, Wilfried; Dickore, Karlfried; and Timmler, Helmut, 3,910,909.

Dictaphone Corporation: *See—*
Kolb, Alfred E.; and Nyffenegger, Willy, 3,911,482.

Didkovsky, Viktor Kirillovich: *See—*
Chemeris, Oleg Nikolaevich; Tretyakov, Evgeny Vasilievich; Didkovsky, Viktor Kirillovich; Kanfer, Vilen Davidovich; Paschenko, Nikolai Konstantinovich; Zeltser, Izmail Grigorievich; Ljukimson, Girgory Mikhailovich; Bashkatov, Alexandr Nikolaevich; Melnikov, Boris Nikolaevich; Medzhibozhsky, Miron Yakovlevich; Goldberg, Ilya Alexandrovich; Juzefovsky, Izrail Abramovich; Ratmansky, Rafail Davidovich; Irkha, Viktor Nikolaevich; Borisov, Jury Nikolaevich; and Kurochkin, Fedor Filippovich, 3,911,175.

Dieckelmann, Gerhard; Hartmann, Helmut; and Plapper, Jurgen, to Henkel & Cie G.m.b.H. Fatty acid ester mixtures liquid at low temperatures and process. 3,910,972, Cl. 260-410.600.

Diehl: *See—*
Gerum, Erich, 3,911,337.

Dierckx, Jozef Aime: *See—*
Janssens, Wilhelmus; Claeys, Daniel Alois; Lemahieu, Raymond Gerard; and Dierckx, Jozef Aime, 3,911,171.

Diesel Kiki Kabushiki Kaisha: *See—*
Okura, Rikuo, 3,910,245.

Dietrich, Johannes: *See—*
Luttgert, Hans; Brunk, Karl; Dietrich, Johannes; and Pahl, Emanuel, 3,910,094.

Di Fiore, Lucio; and Calcagno, Benedetto, to Societa Italiana Resine S.I.R. S.p.A. Method of producing dichloroethane. 3,911,036, Cl. 260-660.000.

Diggs, Thomas M. Plural motor drive including a servo motor control system. 3,911,336, Cl. 318-48.000.

Digital Equipment Corporation: *See—*
Levy, John V.; Jenkins, Stephen R.; Ku, Victor; McLean, Peter; and Hastings, Thomas N., 3,911,400.
McLean, Peter; Jenkins, Stephen R.; and Ku, Victor, 3,911,402.

Dilo, Richard, to Oskar Dilo KG. Needling Apparatus. 3,909,891, Cl. 28-4.00R.

Dittrich, Frank: *See—*
Scheller, Frieder; Megges, Rudolf; Dittrich, Frank; Repke, Kurt; Portius, Hans Joachim; Kammann, Gunter; Schmidt, Hans-Jorg; and Haustein, Knut-Olaf, 3,910,881.

Divan, William J., to Cashin Systems Corporation. Apparatus for slicing food product and separating drafts of slices. 3,910,141, Cl. 83-26.000.

Divine, William J. Uniflow steam engine. 3,910,160, Cl. 91-224.000.

Dixon Automatic Tool, Inc.: *See—*
Dixon, Paul H., 3,910,325.

Dixon, Paul H., to Dixon Automatic Tool, Inc. Automatic fastener driving machine with hand-held driving gun. 3,910,325, Cl. 144-32.000.

Djordjevic, Mihailo: *See—*
Reinhardt, George; Djordjevic, Mihailo; and Breen, Joseph, 3,910,171.

Dobis, Ivan: *See—*
Fojtik, Frank; and Dobis, Ivan, 3,910,676.

Dobson, Thomas A.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, 3,910,901.
Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, 3,910,903.
Jirkovsky, Ivo; Humber, Leslie G.; Demerson, Christopher A.; and Dobson, Thomas A., 3,910,954.

Dr. Otto C. Strecker KG: *See—*
Mosser, Wilhelm, 3,910,520.

Dohgane, Iwao: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Ebara, Kazunari; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; and Yasuda, Minoru, 3,911,030.

Dolfini, Joseph Edward; Slusarchyk, William A.; and Koster, William Henry, to E. R. Squibb & Sons, Inc. Method for preparing 7-substituted cephalosporins by replacement of oxygen containing groups. 3,910,902, Cl. 260-243.00C.

Doll, John A. Tire grooving apparatus. 3,910,228, Cl. 118-35.000.

Dome Chemical Corporation: *See—*
Reese, Stanley, 3,910,463.

Donley, Miller & Nowikas, Inc.: *See—*
Nowikas, Walter M., 3,910,125.

Dootson, David V.: *See—*
Dootson, Norman L., 3,909,939.

Dootson, Norman L., to Colombo, Winifred M.; and Dootson, David V., part interest to each. Safety razor having a row of short convergently slanted counter-stretching tension grooves extending along the guard bar. 3,909,939, Cl. 30-34.200.

Dopyera, Emil E. Apparatus for protecting underwater equipment. 3,910,056, Cl. 61-46.000.

Dorer, Wilfried, to Mathias Bauerle GmbH. Device for opening the flaps of envelopes. 3,910,007, Cl. 53-58.000.

Dorsey, Harold, Jr. Bicycle hitch lock. 3,910,080, Cl. 70-234.000.

Dosne, Daniel, to Societe Nouvelle de Roulements. Rolling members prestressed by a radially resilient ring. 3,910,657, Cl. 308-216.000.

Doss, Reiner: *See—*
Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Reiner; and Kugler, Florian, 3,911,462.

Doubek, Edward R., Jr.; Kennedy, John J.; and Sandmore, Donald K., to Western Electric Company, Incorporated. Method for transferring and bonding articles. 3,909,933, Cl. 29-626.000.

Dougherty, Robert S. Floor structure for cargo container. 3,910,446, Cl. 220-1.500.

Dover Corporation: *See—*
Bertrem, Brad E.; and Young, Dennis L., 3,910,555.

Dow Chemical Company, The: *See—*
Caskey, Terry L.; and Lindblom, Robert O., 3,911,184.
McAda, Robert William, 3,910,878.
Moyer, John R.; and Parmele, Charles S., 3,910,999.
O'Melia, Frances, 3,911,118.
Pitts, Charles A., 3,910,348.
Sbragia, Ronald Joseph, 3,911,127.

Doyotte, Claude Charles: *See—*
Hache, Jean Georges Edouard Joseph; Allioud, Jean-Pierre Achille; and Doyotte, Claude Charles, 3,910,375.

Drabek, Jozef; and Varsanyi, Denis, to Ciba-Geigy Corporation. Insecticidal and acaridal substituted phenyl thiophosphoric acid esters. 3,911,122, Cl. 424-225.000.

Draber, Wilfried; Dickore, Karlfried; and Timmler, Helmut, to Bayer Aktiengesellschaft. Process for the preparation of 1,2,4-triazin-5-one compounds. 3,910,909, Cl. 260-248.0AS.

Draber, Wilfried; Plempel, Manfred; and Buchel, Karl Heinz, to Bayer Aktiengesellschaft. Diaryl-pyridyl-imidazole methanes and their production. 3,910,936, Cl. 260-294.80R.

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Drone, Gary A.; and Schnepp, James M., to Fiat-Allis Construction Machinery, Inc. Crawler tractor oscillating beam mounting. 3,910,367, Cl. 180-9.500.

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Dulog, Lothar G.; and Dewaele, Sylvain A. R., to s.a. Texaco Belgium n.v. Phosphorus derivatives of 1,2,4,5-tetrahydroxy benzene. 3,910,905, Cl. 260-246.00B.

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Fojtik, Frank; and Dobis, Ivan, to Raymond Lee Organization, Inc., The, a part interest. Viewing device. 3,910,676, Cl. 350-68.000.
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Foote, Chauncey P., Jr.: *See—*
D'Amato, Salvatore F.; and Foote, Chauncey P., Jr., 3,910,186.
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Forberg, Hans Jurgen, to Transcodan Sven Husted-Andersen. Cannula for introducing a flexible catheter. 3,910,272, Cl. 128-214.400.
Forbes, Leonard; and Yeargan, Jerry R., to Telex Computer Products, Inc. N-Channel charge coupled device fabrication process. 3,909,925, Cl. 29-578.000.
Ford Motor Company: *See—*
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Fornells, Gilbert P. Dissassemblable fence made of plastics material. 3,910,561, Cl. 256-65.000.
Forsberg, John R., to Helene Curtis Industries, Inc. Compressed air spray apparatus. 3,910,304, Cl. 137-209.000.
Forsberg, Svante: *See—*
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Fortini, Anthony, to United States of America, National Aeronautics and Space Administration. Rocket chamber and method of making. 3,910,039, Cl. 60-265.000.
Fortlage, Donald J., to General Electric Company. Circline lamp carton. 3,910,409, Cl. 206-303.000.
Foss, Norman A.; and Ward, Samuel A. MOS photodiode. 3,911,465, Cl. 357-23.000.
Foster, John A., to J. L. Clark Manufacturing Co. Container having snap-on, twist-off cap. 3,910,444, Cl. 215-295.000.
Foster, John E., to A. B. Dick Company. Ink drop stream integrity checker in an ink jet printer. 3,911,445, Cl. 346-1.000.
Fouillade, Paul H., to Dumex Travaux Publics, a part interest. Construction of immersed structures. 3,910,058, Cl. 61-85.000.
Fourrey, Francois; Pezier, Yves; and Droual, Rene, to Etablissements Bertrand Faure. Vertically adjustable seat supports. 3,910,543, Cl. 248-396.000.
Fox, Edward I.: *See—*
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Foxman, David. Extra oral arch spring force. 3,909,945, Cl. 32-14.00D.
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Franke, Kurt, to Siemens Aktiengesellschaft. X-ray diagnostic apparatus for preparing x-ray exposures including an automatic illuminating device and automatic adjustment of the exposure voltage. 3,911,273, Cl. 250-322.000.
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Frantz, Robert Houston, to AMP Incorporated. Replacement cover for electrical wiring devices. 3,910,672, Cl. 339-97.00P.
Franz, John E., to Monsanto Company. N-phenylsulfonamido-n-phosphonomethyl glycine and certain derivatives thereof. 3,910,969, Cl. 260-397.70R.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
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Frezza, Robert, to Samcoe Holding Corporation. Method for heat-treating knitted fabric in tubular distended form. 3,909,890, Cl. 26-56.000.
Frick, Heinrich: *See—*
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Fritsch, Werner: *See—*
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Frumerman, Robert; and Brown, William W., to Westinghouse Electric Corporation. Method and apparatus for removing radioactive gases from a nuclear reactor. 3,910,817, Cl. 176-37.000.

Fry, William Lawrence, to Rist's Wires & Cables Limited. Wiring harness and method of making same. 3,911,201, Cl. 174-72.00A.

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Fuerst, Ernst; Winderl, Siegfried; Wittwer, Arnold; and Hoffmann, Herwig, to BASF Aktiengesellschaft. Manufacture of succinimide. 3,910,951, Cl. 260-326.5FM.

Fuhrmann, Robert: *See—*
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Fujikawa, Kyoichiro; and Takamiya, Saburo. Magnetic-to-electric conversion semiconductor device. 3,911,468, Cl. 357-27.000.

Fujio, Hinomaru; Fukunaga, Kazunori; and Nakamura, Naoyuki, to Matsushita Electronics Corporation. Apparatus for producing fluorescent lamps. 3,910,662, Cl. 316-30.000.

Fujioka, Tokio; Hoshino, Kazuo; Ito, Kenjiro; and Igawa, Takashi, to Nisshin Steel Co., Ltd. Austenitic stainless steel. 3,910,788, Cl. 75-125.000.

Fujisawa, Hideya; and Omori, Norio, to Nippondenso Co., Ltd. Electronically controlled fuel injection system. 3,910,241, Cl. 123-32.0EA.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
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Fujita, Hideo; Hachisuka, Kozo; Furukawa, Kiyoshi; Matsutani, Tsutomu; Kobayashi, Kei; Yonekura, Shiro; Takano, Akiyoshi; and Nakazawa, Hiroshi, to Dainichi-Nippon Cables, Ltd.; and Mitsuba Mfg. Co., Ltd. Method of manufacturing multilayered articles. 3,911,069, Cl. 264-23.000.

Fujita, Katsunori: *See—*
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Fukuhara, Shigetomi; and Ito, Takakiyo, to Hitachi, Ltd. Automatic focus adjusting device for use in information retrieving apparatus. 3,910,695, Cl. 353-101.000.

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Fuller, Homer Donald; and Little, James Arthur, to Allied Chemical Corporation. Automatic coal charging car. 3,910,431, Cl. 214-35.00R.

Funaki, Takashi; and Hashimoto, Katuo, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Indicia display unit. 3,910,032, Cl. 58-125.00C.

Funston, Jules H.; Grumet, Elmer O.; Mast, Henry G.; and Scott, Charles J., to Samsonite Corporation. Turn-button fastener. 3,909,888, Cl. 241-221.00R.

Furukawa, Kiyoshi: *See—*
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G.A.O. Gesellschaft fur Automation und Organization mbH: *See—*
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Sthare, Derwin K.; and Ledford, William T., 3,910,759.

Gage, Lonnie L. Oil well pump. 3,910,730, Cl. 417-554.000.

Gagle, Duane W.; and Draper, Homer L., to Phillips Petroleum Company. Free-draining granular base for prepared ground surface. 3,910,710, Cl. 404-28.000.

Gaines, Marvin E.: *See—*
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Galantay, Eugene E., to Sandoz, Inc. 1-Alkoxy-1-aryl-2,3-butadienes. 3,911,021, Cl. 260-611.00A.

Gall, Martin; and Hester, Jackson B., Jr., to Upjohn Company, The. 2-[3,5-Disubstituted-4H-1,2,4-triazol-4-yl]benzhydrol. 3,910,943, Cl. 260-308.00R.

Gall, Martin, to Upjohn Company, The. Spiro(cyclopropane-1,4'-(4H)-s-triazolo-(4,3-a)(1,4)benzodiazepines). 3,910,944, Cl. 260-308.00R.

Gall, Martin, to Upjohn Company, The. 4H-Imidazo[1,2-a][1,4]benzodiazepines. 3,910,946, Cl. 260-309.000.

Gallant, Donald A., to Longwood Machine Works, Incorporated. Atomizer. 3,910,496, Cl. 239-118.000.

Galves, Jean-Pierre; and Trotta, Paul-Louis, to Thomson-CSF. Plural phosphor layer screen. 3,911,310, Cl. 313-473.000.

Garber, Murray: *See—*
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Garcea, Giampaolo, to Alfa Romeo S.p.A. Device for detecting the overheating of a catalyst traversed by the exhaust gas of an explosion engine. 3,910,040, Cl. 60-277.000.

Gardner, Delbert J.; Sisco, William C.; Grabb, Frederick G.; and Owens, Carl D., to Bendix Corporation, The. Two stage servomotor. 3,910,046, Cl. 60-553.000.

Gardner, Delbert J., to Bendix Corporation, The. Hydraulic lock for hydraulic ratio changer. 3,910,048, Cl. 60-568.000.

Gardner, James Dennis, to Firestone Tire & Rubber Company, The. Pneumatic tire-rim combination with run-flat capabilities. 3,910,334, Cl. 152-330.00L.

Gardner, Richard H., to B. F. Goodrich Company, The. Disc brake caliper and mounting structure. 3,910,385, Cl. 188-73.300.

Gardner, Ronald E., to Hi-Shear Corporation. Separation nut. 3,910,154, Cl. 85-33.000.

Gargano, Richard Joseph. Bottle safety cap. 3,910,442, Cl. 215-218.000.

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Garrett, Donald E.; Kallerud, Mauritz J.; and Chemtob, Elie M., to Occidental Petroleum Corporation. Beneficiation of salts crystallized from searles lake brine. 3,910,773, Cl. 23-297.000.

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Garrou, Philip H.; and Schubert, William D., to Pilot Research Corporation. Panty hose with terry loop crotch insert. 3,909,851, Cl. 2-224.00R.

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Garza, Roberto Gavazos; and Martin, John R., to Vidriera Monterrey, S.A. Container closure. 3,910,445, Cl. 215-328.000.

Gassaway, James Scott. Equipment security locking device. 3,910,079, Cl. 70-58.000.

Gau, Leonard P.; Riley, Donald E.; and Carter, Ivor W., to Chrysler Corporation. Electronic spark timing advance and emission control system. 3,910,243, Cl. 123-117.00R.

Geary, William M. Soap holder. 3,910,661, Cl. 312-351.000.

Gebr. Bohler & Co. Aktiengesellschaft: *See—*
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Gelfand, Samuel, to Hooker Chemicals & Plastics Corporation. Process for preparing 2,5-dihalo-3-nitrobenzoic acid. 3,910,995, Cl. 260-515.00A.

Gelin, Robert J.; Stotler, David V.; and Daugherty, John W., to Owens-Corning Fiberglas Corporation. Collection tubes for rotary collection of filamentary material. 3,910,513, Cl. 242-18.00G.

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Gerlach, C. Richard, to Southwest Research Institute. Flow meter. 3,910,112, Cl. 73-210.000.
German, Ronald L. Spark plug holder. 3,910,541, Cl. 248-231.000.
Gerum, Erich, to Diehl. Driving and stabilizing circuit for an electromechanical oscillator. 3,911,337, Cl. 318-130.000.
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Gezari, Walter A., to International Telephone and Telegraph Corporation. Sanitary holding sump and method of making. 3,910,449, Cl. 220-9.00F.
Giannuzzi, Robert J.; Langdon, Glen G., Jr.; and Pasternak, Edward, to International Business Machines Corporation. Alphanumeric character display scheme for programmable electronic calculators. 3,911,424, Cl. 340-324.00R.
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Giebler, Fritz; and Rath, Peter, to Siemens Aktiengesellschaft. Circuit arrangement for connecting telegraph and data subscribers to a switching system. 3,911,205, Cl. 178-2.00R.
Gielly, Jean-Francois, to Rhone-Progil. Method of producing phosphoric acid and calcium sulphate. 3,911,079, Cl. 423-167.000.
Giesfeldt, John C., to Baskettes Ltd. Means for making potato baskets. 3,910,548, Cl. 249-141.000.
Giesselmann, Hannes, to Husqvarna AB. Sewing machine case. 3,910,329, Cl. 150-52.00R.
Gilland, Jerry R.; and Emming, Jan G., to Ball Brothers Research Corporation. Position sensitive multiwire proportional counter with integral delay line. 3,911,279, Cl. 250-385.000.
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Gmelin, Eberhard; and von Alpen, Ulrich, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Method and apparatus for producing variable temperature with the aid of a cryoliquid. 3,910,064, Cl. 62-514.000.
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Good, Elmer J. Portable placer mining apparatus. 3,910,837, Cl. 209-461.000.
Goodheart, Paul; and Sheng, Abel Ching Nam, to RCA Corporation. Relaxation oscillator having stable pulse width. 3,911,377, Cl. 331-111.000.
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Gottschalk, Claus, to J.S. Staedtler, Firma. Air pressure compensation arrangement for a cartridge and writing or drawing instrument. 3,910,707, Cl. 401-135.000.
Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., to Bristol-Myers Company. 7-(2-Aminomethylphenyl-acetamido)-3-[2-(5-hydroxymethyl-1,3,4-thiadiazolyl)-thiomethyl]-3-cephem-4-carboxylic acid. 3,910,899, Cl. 260-243.00C.
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Gow, George G. Intercommunication and security system. 3,911,228, Cl. 179-37.000.
Grabb, Frederick G., to Bendix Corporation, The. Two stage servomotor with smooth actuation sequence. 3,910,047, Cl. 60-554.000.
Grabb, Frederick G.: *See*—
Gardner, Delbert J.; Sisco, William C.; Grabb, Frederick G.; and Owens, Carl D., 3,910,046.
Graczyk, Bronislaus S.: *See*—
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Graf, Robert J.: *See*—
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Grafton, David A.: *See*—
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Graham, Alexander L.; and Cleland, Robert L., to Harry W. Dietert Co. Structure for foundry slurry viscosity reduction. 3,910,564, Cl. 259-154.000.

Granatek, Alphonse P.: *See—*
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Grandview Industries, Limited: *See—*
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Grasselli, Robert K.; and Hardman, Harley F., to Standard Oil Company, The. Process for the preparation of botadiene from N-butene. 3,911,039, Cl. 260-680.00E.

Greek, John Charlie, Jr.; McBride, Michael Eudell; and Tanner, Howard Carl, to International Business Machines Corporation. Text processing system. 3,911,407, Cl. 340-172.500.

Greene, Peter Townsend; Rau, Hans; and Wegener, Joachim Rolf, to U.S. Philips Corporation. Method of preparing a metal powder mainly consisting of iron. 3,910,785, Cl. 75-5.0BA.

Grieves, John: *See—*
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Griffith, Glen R.: *See—*
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Grip-It, Inc.: *See—*
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Grix, Arthur R., to Wagner Electric Corporation. Electro-pneumatic air brake valve and system compatible with a skid control system. 3,910,646, Cl. 303-21.00A.

Groby, Chester; Crafoord, Carl-Goran; and Grieves, John, to Aktiebolaget Tudor. Electrical battery. 3,910,800, Cl. 136-170.000.

Group 4 Total Security Limited: *See—*
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Groux, Michel John Arthur; and Moinas, Miche, to Societe d'Assistance Technique pour Produits Nestle S.A. Cheese flavoring. 3,911,158, Cl. 426-534.000.

Grove, Leslie H. Rotary mechanism having at least two camming elements. 3,910,733, Cl. 418-61.00B.

Grumet, Elmer O.: *See—*
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Grunert, Hellmuth; Vitt, Theodor; and Gortz, Johannes, to Prameta Prazisionsmettall-und Kunststofferzeugnisse G. Baumann & Company. Hinges for abutting door sashes. 3,909,879, Cl. 16-164.000.

Grzina, Anthony; and Fedeler, John Henry Ephraim, to Warman Equipment (International) Ltd. Thickener mechanism. 3,910,843, Cl. 210-531.000.

GTE Automatic Electric Laboratories Incorporated: *See—*
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GTE Information Systems Incorporated: *See—*
O'Neill, Joseph L., Jr., 3,911,403.
O'Neill, Joseph L., Jr., 3,911,404.

GTE Sylvania Incorporated: *See—*
Makar, Francis B., Jr., 3,911,313.
Martin, Brice E.; Ritsko, Joseph E.; and Long, Robert E., Jr., 3,911,077.

Guastella, Samuel L.; and Larrivee, Jerry J., Jr., to Blandin Paper Company. Coated paper products. 3,911,191, Cl. 428-342.000.

Gudmestad, Ragnar, to Artos Engineering Company. Apparatus for producing electrical conductors. 3,909,900, Cl. 29-203.0DT.

Guenin, Andre; and Zellweger, Conrad, to La Nationale S.A. Cigarette lighter. 3,910,750, Cl. 431-150.000.

Guerin, Adolphe M. Crete. Hollow roller having an apertured surface for treating the ground. 3,910,712, Cl. 404-124.000.

Guinot, Gabriel L., to Societe Anonyme Poclain. Back-acting shovel having cooperating turret mounted blade. 3,909,962, Cl. 37-117.500.

Guiraud, Francois, to Fichet-Bauche. Multiple bolt and keeper lock. 3,910,612, Cl. 292-33.000.

Gulf Research & Development Company: *See—*
Kobylinksi, Tadeusz P.; and Taylor, Brian W., 3,910,770.
Onopchenko, Anatoli; Schulz, Johann G. D.; and Seekircher, Richard, 3,910,996.

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Gun, Dmitry Rudolfovich: *See—*
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Gurtler, Richard W., to Motorola Inc. Method for fabricating a liquid crystal display device. 3,909,930, Cl. 29-592.000.

Gusdorf, John, to Gusdorf & Sons. Knock down cart construction. 3,910,205, Cl. 108-101.000.

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Gustav F. Gerdts KG: *See—*
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Gustavsson, Arne, to Stiga AB. Locking and releasing means for the throwing arm on clay pigeon throwing apparatus. 3,910,249, Cl. 124-8.000.

H. G. Weber and Company, Inc.: *See—*
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H. Koch & Sons, Inc.: *See—*
Sutliff, Roderick W.; and Edwards, David W., 3,910,457.

H. W. Crane Company: *See—*
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Haag, Albert, to Karl Muller, Fahrzeugwerk, Firma. Vehicle for the transporting of containers and the like. 3,910,435, Cl. 214-390.000.

Habersang, Silke: *See—*
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Hache, Jean Georges Edouard Joseph; Allioud, Jean-Pierre Achille; and Doyotte, Claude Charles, to Bertin & Cie. Jet engine silencer. 3,910,375, Cl. 181-33.0HC.

Hachisuka, Kozo: *See—*
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Hadhanyi, Andreas, to Trommsdorff, H. Cycloheptaamylose-silver alkanol ammine complex compound. 3,911,115, Cl. 424-180.000.

Hadley, William Henry, to Metal Closures Limited. Closures. 3,910,443, Cl. 215-252.000.

Haede, Werner; Fritsch, Werner; Stache, Ulrich; and Lindner, Ernst, to Hoechst Aktiengesellschaft. Cardioactive anhydrotalomethylosides and process for preparing them. 3,910,882, Cl. 260-210.500.

Haffner, Donald G.: *See—*
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Halder, Niklaus; and Frick, Heinrich, to Hoffmann-La Roche Inc. Preparation of methylheptenone. 3,911,019, Cl. 260-597.00R.

Halfar, Kurt: *See—*
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Hall, John B.; and Sanders, James Milton, to International Flavors & Fragrances Inc. Novel process and products produced by said process. 3,911,018, Cl. 260-586.00C.

Hallwood, Reginald: *See—*
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Halsey, George H. Non-destructive testing procedures. 3,910,124, Cl. 73-67.600.

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Hamilton, Jock. Pool chlorination diffuser. 3,911,068, Cl. 261-121.00R.

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Hammersmith, James R.; and Cogbill, Philip H., II, to Brown and Williamson Tobacco Corporation. Programmed filter. 3,910,288, Cl. 131-10.500.

Hammes, Wilhelm. Bung drum made of plastics with one or more bung openings. 3,910,450, Cl. 220-67.000.

Hanada, Kazunori: *See—*
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Hanson, William L., to Research Corporation. Antigenic preparation suitable for diagnosis of chronic chagas disease. 3,911,097, Cl. 424-12.000.

Hara, Hiramasa; Nakano, Muneharu; and Kamiura, Saburo, to Seinankaihatu Co. Ltd. Method of preserving the color of animal tissue. 3,911,146, Cl. 426-265.000.

Hard, Robert A., to Kennecott Copper Corporation. Process for in-situ mining. 3,910,636, Cl. 299-5.000.

Hardesty, Samuel J., Jr.; and Masters, Harvey M., to Westinghouse Electric Corporation. Test set controlled by a remotely positioned digital computer. 3,910,322, Cl. 340-172.500.

Hardin, James T.: *See—*
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Harding, Betsey J. Stenographic braille machine. 3,910,397, Cl. 197-6.100.

Harding, John; and Placzek, Peter, to Prismo Universal Limited. Method and apparatus for spraying liquid material. 3,910,323, Cl. 141-2.000.

Hardison, Artson P., to Xeros Controls. Drip irrigation system and components thereof. 3,910,500, Cl. 239-310.000.

Hardman, Harley F.: *See—*
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Harris, Henry Clinton: *See—*
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Harris, James A.: *See—*
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Harris, Jerome N.: *See—*
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Harrison, Frank: *See—*
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Harrison, Ian T.: *See—*
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Harrison, Michael, to Colgate-Palmolive Company. Gel dentifrices. 3,911,104, Cl. 424-52.000.
Harrison, Taylor H., to Harrison, Frank. Steam generator. 3,910,498, Cl. 239-137.000.
Harry W. Dietert Co.: *See—*
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Hart, Cornelis Maria; and Slob, Arie, to U.S. Philips Corporation. Circuit arrangement having at least one circuit element which is energised by means of radiation and semiconductor device suitable for use in such a circuit arrangement. 3,911,269, Cl. 250-211.00J.
Harth, Wolfgang; and Muller, Jorg, to Licentia Patent-Verwaltungs-G.m.b.H. Tuneable delay line. 3,911,382, Cl. 333-84.00M.
Hartig, Gunter. Method and apparatus for distributorless ignition. 3,910,247, Cl. 123-148.00E.
Hartmann, Helmut: *See—*
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Hartmann, Peter; Roos, Ernst; Esch, Erich; Fries, Hermann; and Hentze, Gunter, to Bayer Aktiengesellschaft. Process for the production of shaped structures resistant to high temperatures. 3,911,045, Cl. 260-826.000.
Hartung, Dudley B., to Xenex Corporation. Adaptive control system. 3,911,347, Cl. 318-632.000.
Hasegawa, Shin; and Brewster, Linda C., to United States of America, Agriculture. Limonoate dehydrogenase and debittering of citrus products and by-products therewith. 3,911,103, Cl. 426-51.000.
Hasewend, Florian, to Gebr. Bohler & Co. Aktiengesellschaft. Apparatus for drilling and enlarging a bore. 3,910,361, Cl. 175-207.000.
Hashimoto, Katuo: *See—*
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Hatch, William B., to Raytheon Company. Constant beamwidth antenna. 3,911,442, Cl. 343-754.000.
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Haury, Andre Lucien; and Duclos, Michel Louis, to La Telemecanique Electrique. System providing power supply connections and interconnections for logic modules. 3,911,328, Cl. 317-118.000.
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Held, Manfred; Spies, Johann; and Thomanek, Franz Rudolf, to Messerschmitt-Bolkow-Blohm G.m.b.H. Apparatus for actuating vehicle safety devices. 3,911,391, Cl. 340-52.00H.
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Ishikawa, Masakazu: *See—*
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Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Production of quinazolinone compounds. 3,910,911, Cl. 260-251.0QB.
Ishizumi, Kikuo: *See—*
Akatsu, Mitsuhiro; Kume, Yoshiharu; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; Izumi, Takahiro; Inaba, Shigeho; and Yamamoto, Hisao, 3,910,889.
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Iten, Clemens A., to Philip Morris Incorporated. Safety razor combination. 3,909,940, Cl. 30-47.000.
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Ito, Sadayoshi: *See—*
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Ito, Yosikazu: *See—*
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Itoh, Yasuo, to Victor Company of Japan, Ltd. Demodulation system for angle-modulated wave picked up from a multi-channel record disc. 3,911,232, Cl. 179-100.4ST.

Ivanier, Isin. Deforming tool for die making. 3,910,100, Cl. 72-479.000.

Iwade, Motoo, to Ise Electronics Corporation. Digital clocks. 3,910,030, Cl. 58-50.00R.

Iwama, Katsuaki: *See—*
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Iwata, Hiroshi, to West Electric Company, Ltd. Light control device. 3,910,687, Cl. 350-267.000.

Izumi, Takahiro: *See—*
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Izumi, Yoshihiro; and Kawasaki, Tatsuo, to Matsushita Electronics Corporation. Decimal point display circuit. 3,911,262, Cl. 235-156.000.

Izumitani, Tetsuro: *See—*
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Izzo, Michael. Hair coverings with interchangeable components. 3,910,292, Cl. 132-53.000.

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Pedersen, Carl O.; and Parquet, Donald J., 3,910,566.
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Jackman, Victor, to Fox, John M.; McKeever, John V.; Ferguson, Harry F.; and Sotak, John B., part interest to each. Method and apparatus for processing refuse, sewage and/or waste material into a source of energy. 3,910,775, Cl. 44-13.000.

Jackson, Edgar D., to Steel Web Corporation. Beam connector. 3,910,001, Cl. 52-281.000.

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Jacobs, Klaus: *See—*
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Jacobsen Manufacturing Company: *See—*
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Jaegle, Yves Germain, to Brasseries Kronenbourg S.A. Tanks. 3,910,172, Cl. 99-276.000.

Jaeschke, Harold R., to Hoerner Waldorf Corporation. Reclosable carton. 3,910,487, Cl. 229-51.0TC.

Jahn, Helmut: *See—*
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Leibrecht, Klaus; and Jahn, Helmut, 3,911,254.

Jakob, Fritz, to Linde Aktiengesellschaft. Absorption system for separate recovery of carbon dioxide and hydrogen sulfide impurities. 3,910,777, Cl. 55-48.000.

Jamba, Michael. Four piece isometric exerciser. 3,910,573, Cl. 272-79.00R.

James, Benjamin, to Westinghouse Electric Corporation. Fuel element handling arrangement and method. 3,910,006, Cl. 53-37.000.

James, Daniel Shaw, to Du Pont de Nemours, E. I., and Company. Biscationic disazo dyes for acid-modified nylons. 3,910,876, Cl. 260-191.000.

James, John William: *See—*
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James, Richard. Piston power unit with stratifying ignition system. 3,910,238, Cl. 123-18.00R.

James, Richard. Opposed piston power unit. 3,910,239, Cl. 123-18.00R.

James, Varnell L.; and Hill, Eugene G., to Boeing Company, The. Leading edge flap. 3,910,530, Cl. 244-42.00D.

James, W. Thomas, to Renner Company, The. Tailgate conveyor. 3,910,437, Cl. 214-509.000.

Jamieson, Patrick J., to Rothmans of Pall Mall Canada Limited. Apparatus for automatically controlling the initiation and/or termination of functions of apparatus or processes using a clock pulse generator. 3,911,331, Cl. 328-75.000.

Janhunen, Matti Aapeli. Structure for waterproofing a water cistern of a water tower of prefabricated element construction. 3,909,999, Cl. 52-249.000.

Janitsch, Anthony D.: *See—*
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Janke, Donald Edward, to Whirlpool Corporation. Phase shift to prevent relay contact erosion in a clothes dryer. 3,909,955, Cl. 34-45.000.

Jankowski, Alfred S.; and Moll, John L., to Fairchild Camera and Instrument Corporation. Alpha-numeric display package. 3,911,430, Cl. 340-378.00R.

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Jankowski, Fred, to United States of America, National Aeronautics and Space Administration. Quick disconnect filter coupling. 3,910,307, Cl. 137-515.300.

Janssen, Paul Adriaan Jan; van Wijngaarden, Ineke; and Soudijn, Willem, to Janssen Pharmaceutica N.V. 1- 1-[2-(1,4-Benzodioxan-2-yl)-2-hydroxyethyl]-4-piperidyl -2-benzimidazolinones. 3,910,930, Cl. 260-293.580.

Janssen Pharmaceutica N.V.: *See—*
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Janssens, Wilhelmus; Claeys, Daniel Alois; Lemahieu, Raymond Gerard; and Dierckx, Jozef Aime, to Agfa-Gevaert, a naamloze vennootschap. Thermographic recording process. 3,911,171, Cl. 427-145.000.

Japan Exlan Company, Limited: *See—*
Sone, Masao; Arai, Kojiro; and Nomura, Katsuaki, 3,910,026.

Japan Gasoline Co., Ltd.: *See—*
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Jarrard, Jerry W., to Neomed Incorporated. Switching device for electro-surgical instruments. 3,911,241, Cl. 200-157.000.

Jautelat, Manfred: *See—*
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Jay, Walter M. Table. 3,910,206, Cl. 108-159.000.

Jefferies, Robert Kennedy; Wickline, Glenn D., deceased; by Wickline, Barbara Alice, executrix; and Mirdadian, Kian Mohammed, to Offshore Company, The. Motion compensated blowout and loss circulation detection. 3,910,110, Cl. 73-155.000.

Jeitschko, Wolfgang Karl: *See—*
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Jepsen, Robert E.; Liberty, Jean C.; and Luybli, Richard E., to Air Products and Chemicals, Inc. Compressor. 3,910,729, Cl. 417-417.000.

Jerila, Torsti T. T., to Acme General Corporation. Door stiffener. 3,910,003, Cl. 52-632.000.

Jesse, Edwin L., to Evans Products Company. Structural foam skid. 3,910,204, Cl. 108-55.000.

Jirkovsky, Ivo; Humber, Leslie G.; Demerson, Christopher A.; and Dobson, Thomas A., to Ayerst, McKenna and Harrison Ltd. Indenopyran- and indenothiopyranalkylamines. 3,910,954, Cl. 260-327.0TH.

Jirkovsky, Ivo: *See—*
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Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, 3,910,903.

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Johanns, Heinz: *See—*
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John Wyeth & Brother Limited: *See—*
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Cavalla, John Frederick; and Archibald, John Leheup, 3,910,932.

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Johnson, Dennis A.; and Johnson, Samuel C., to Raymond Lee Organization, Inc., The, a part interest. Portable vinyl auto top cover. 3,910,330, Cl. 150-52.00K.

Johnson, H. William, to Svenska Manufacturing Corporation. Vacuum packaging. 3,910,008, Cl. 53-112.00A.

Johnson & Johnson: *See—*
Miller, Shirley A., 3,910,268.

Johnson, Lyle J., to Rossi, Irving. Molds for continuous casting. 3,910,342, Cl. 164-273.00R.

Johnson, Otto E.; and Ward, Gerald G., to International Harvester Company. Toggle trip for moldboard plow. 3,910,354, Cl. 172-267.000.

Johnson, Samuel C.: *See—*
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Johnson Service Co.: *See*—
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Johnsson, Stig Arthur; and Berglund, Arne Emil, to AB Bofors. Wheeled carriage for artillery. 3,910,157, Cl. 89-40.00R.
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Jones, Everett E., to Boeing Company, The. Hydraulic-forming machine. 3,910,087, Cl. 72-63.000.
Jones, Peter Hadley; Kyncl, Jaroslav; Ours, Carroll Wayne; and Somani, Pitambar, to Abbott Laboratories. Esters of γ-glutamyl amide of dopamine. 3,910,988, Cl. 260-471.00A.
Jones, Ray L. Apparatus for testing and analyzing fluid mixture. 3,911,256, Cl. 235-151.300.
Juhasz, Albert J.; and Niedzwiecki, Richard W., to United States of America, General Counsel-Code GP. Controlled separation combustor. 3,910,035, Cl. 60-39.230.
Julius Sprick KG, Firma: *See*—
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Jureit, John C.; and Hoffman, Lawrence A., to Automated Building Components, Inc. Automated saw. 3,910,142, Cl. 83-71.000.
Jureit, John Calvin, to Automated Building Components, Inc. Wood joint and connector plates. 3,910,153, Cl. 85-13.000.
Jureit, John Calvin; Leutwyler, Roy; Brodsky, Larry; Kushner, Benjamin; and Castillo, Adolfo, to Automated Building Components, Inc. Connector plate coil support. 3,910,512, Cl. 242-1.000.
Juriev, Jury Nikolaevich: *See*—
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Jury, Harold Rex; and Howells, Ronald McKenzie, to Comalco (J. & S.) Pty. Limited. Metal expanding machine. 3,910,092, Cl. 72-302.000.
Justice, Jerry Patton. Rifle lift. 3,910,382, Cl. 187-1.00R.
Juy, Lucien Charles Hippolyte. Protection apparatus for a speed change mechanism of a bicycle or similar vehicle. 3,910,136, Cl. 74-611.000.
Juzefovsky, Izrail Abramovich: *See*—
Chemeris, Oleg Nikolaevich; Tretyakov, Evgeny Vasilievich; Didkovsky, Viktor Kirillovich; Kanfer, Vilen Davidovich; Paschenko, Nikolai Konstantinovich; Zeltser, Izmail Grigorievich; Ljukimson, Girgory Mikhailovich; Bashkatov, Alexandr Nikolaevich; Melnikov, Boris Nikolaevich; Medzhibozhsky, Miron Yakovlevich; Goldberg, Ilya Alexandrovich; Juzefovsky, Izrail Abramovich; Ratmansky, Rafail Davidovich; Irkha, Viktor Nikolaevich; Borisov, Jury Nikolaevich; and Kurochkin, Fedor Filippovich, 3,911,175.
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Kabushiki Kaisha Hukuba Future Research: *See*—
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Kaeding, Warren W.; and Butter, Stephen A., to Mobil Oil Corporation. Conversion of methanol and dimethyl ether. 3,911,041, Cl. 260-682.000.
Kaelin, Joseph Richard. Method and apparatus for the purification of aqueous effluent. 3,910,838, Cl. 210-7.000.
Kagiwada, Reynold S.: *See*—
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Kaiser, Carl; and Wardell, Joe R., Jr., to SmithKline Corporation. 3-Substituted-4-hydroxyphenyl-2-piperidylcarbinols. 3,910,933, Cl. 260-293.730.
Kaiser, Heinz W. Rotatable coupling for fluid and electrical services. 3,910,309, Cl. 137-580.000.
Kakeda, Teruyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrical optical modulator. 3,910,680, Cl. 350-160.0LC.
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Kanai, Hiromi; and Yamazaki, Eiichi, to Hitachi, Ltd. Method of fabricating secondary electron emission preventive film and colour picture tube having same. 3,911,165, Cl. 427-68.000.
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Kaneko, Shiro; Masuda, Sakae; Ujihara, Motohiro; and Uchida, Yosuke, to Fuji Photo Film Co., Ltd. Apparatus for producing photographic light-sensitive substance by spray drying. 3,910,812, Cl. 159-3.000.
Kanfer, Vilen Davidovich: *See*—
Chemeris, Oleg Nikolaevich; Tretyakov, Evgeny Vasilievich; Didkovsky, Viktor Kirillovich; Kanfer, Vilen Davidovich; Paschenko, Nikolai Konstantinovich; Zeltser, Izmail Grigorievich; Ljukimson, Girgory Mikhailovich; Bashkatov, Alexandr Nikolaevich; Melnikov, Boris Nikolaevich; Medzhibozhsky, Miron Yakovlevich; Goldberg, Ilya Alexandrovich; Juzefovsky, Izrail Abramovich; Ratmansky, Rafail Davidovich; Irkha, Viktor Nikolaevich; Borisov, Jury Nikolaevich; and Kurochkin, Fedor Filippovich, 3,911,175.
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Karageozian, Hampar L.; and Rudko, Paul, to Allergan Pharmaceuticals. Method of removing proteinaceous deposits from contact lenses. 3,910,296, Cl. 134-2.000.
Karam, Ronald E.; and Swarthout, David J., to Xerox Corporation. Milling trigonal selenium particles to improve xerographic performance. 3,911,091, Cl. 423-510.000.
Kariyone, Kazuo; Tanaka, Kunihiko; and Takai, Keiji, to Fujisawa Pharmaceutical Co., Ltd. Process for preparing 1,2,5-thiadiazol-3-ylacetic acid from 3-methyl-1,2,5-thiadiazole. 3,910,939, Cl. 260-302.00D.
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Kataoka, Akihiko, to Dainippon Ink & Chemicals, Inc.; and Japan Gasoline Co., Ltd. Cultivation apparatus for micro-organisms. 3,910,826, Cl. 195-142.000.
Kato, Fumiyoshi: *See*—
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Katsumura, Hiroshi; Kaneda, Kei; and Abe, Osamu, to Tokyo Shibaura Electric Co., Ltd. Light-emitting display device. 3,911,431, Cl. 340-378.00A.
Katter, Lincoln B.; and Wells, Michael W., to Rocket Research Corporation. Aspirating apparatus and method for crash restraint system. 3,910,595, Cl. 280-150.0AB.
Kavan, Vladimir, to Olin Corporation. Powder-actuated tool. 3,910,477, Cl. 227-10.000.
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Kawahara, Kansi, to Mitsui Mining & Smelting Co., Ltd.; and Kawahara Seisakusho Co., Ltd. Method and apparatus for arranging objects. 3,910,424, Cl. 214-6.0DK.
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Kawase, Hiroshi, to Ricoh Watch Co., Ltd. Method and apparatus for beauty and therapeutic treatment. 3,910,266, Cl. 128-66.000.
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Kazama, Munetada: *See*—
Tabei, Hitoshi; and Kazama, Munetada, 3,911,383.
Keating, Richard T. Deep fat fryer with melt control. 3,911,249, Cl. 219-441.000.
Keenan, Charles A.: *See*—
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Keese, Beth: *See*—
Sietmann, Vernon H., 3,910,285.
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Keida, Teruho, to Citizen Watch Co., Ltd. Wrist-watch casing. 3,910,031, Cl. 58-88.00R.
Keimel, Arthur C.: *See*—
Keimel, Robert W.; Keimel, Arthur C.; and Thomas, John F., 3,910,254.
Keimel, Robert W.; Keimel, Arthur C.; and Thomas, John F., to United States of America, Navy. Smokestack having reduced air emission. 3,910,254, Cl. 126-307.000.
Keizer, Eugene Orville, to RCA Corporation. Color picture/sound record. 3,911,476, Cl. 358-4.000.
Kelsey, Paul S. Precast panels with corner-divider projections. 3,910,000, Cl. 52-259.000.
Kemira Oy: *See*—
Tuomarla, Juhani; Raisanen, Kalervo; and Arvinen, Aulis, 3,910,839.
Kennecott Copper Corporation: *See*—
Hard, Robert A., 3,910,636.
Probert, Thomas I.; Richards, Kenneth J.; Wright, Craig N.; and Entrop, Gerard E., 3,911,076.
Kennedy, John J.: *See*—
Doubek, Edward R., Jr.; Kennedy, John J.; and Sandmore, Donald K., 3,909,933.
Kent, Leslie Wayne. Artificial fishing lure. 3,909,974, Cl. 43-42.310.
Kenworthy, Raymond; and Porter, Philip, to Lever Brothers Company. Rearing calves. 3,911,109, Cl. 424-92.000.
Kenyon, Richard Arthur; and Vogl, Norbert George, Jr., to International Business Machines Corporation. N-phase bucket brigade optical scanner. 3,911,290, Cl. 307-221.00C.
Kerwin, William S.; Nelson, John Rodney; and Toll, Hans Robert, to Toll Cryogenics, Inc. Cryogenic deflashing apparatus. 3,909,988, Cl. 51-163.000.
Keseleski, Adam John; and Michel, Gerd Wilhelm, to E. R. Squibb & Sons, Inc. Recrystallization process for the purification of nystatin. 3,911,113, Cl. 424-123.000.
Kessel, Heinrich: *See*—
Macrander, Karl; and Kessel, Heinrich, 3,909,863.
Kessler, Hans, to Ferentzi, Paul. Device for wet-processing leather or hides. 3,910,077, Cl. 69-32.000.
Kessler, Milton. Method of making thin-walled plastic screw caps. 3,911,074, Cl. 264-318.000.
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Hawthorne, Vaughn T., 3,910,418.
Kidokoro, Susumu: *See*—
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Kiehn, Mogens. Combination mast and light raising signalling means and lowering apparatus. 3,911,267, Cl. 240-64.000.
Kierstead, Richard Wightman; and Lemahieu, Ronald Andrew, to Hoffmann-La Roche Inc. Synthesis of hydroxycyclopenten-1-ones. 3,911,026, Cl. 260-617.00R.
Kiesling, Casper, to Raymond Lee Organization, Inc., The, a part interest. Method of making a prefabricated electrical wall structure. 3,909,912, Cl. 29-428.000.
Kihara, Nobutoshi; and Machida, Yukihiko, to Sony Corporation. Apparatus and method for recording and reproducing a video signal in successive record tracks on a record sheet without guard bands between adjacent tracks. 3,911,483, Cl. 360-33.000.
Kikugawa, Kiyomi; Suehiro, Hideo; Sugata, Leiko; Ichino, Motonobu; and Nakamura, Tokuro, to Kohjin Co., Ltd. S-Substituted-2-thioadenosines and process for producing the same. 3,910,883, Cl. 260-211.50R.
Kikugawa, Kiyomi; Suehiro, Hideo; Iizuka, Kazuhiro; Sugata, Leiko; Ichino, Motonobu; and Nakamura, Tokuro, to Kohjin Co., Ltd. S-Substituted-2-thioadenosines and process for producing the same. 3,910,884, Cl. 260-211.50R.
Kikusui Kagaku Kogyo Kabushiki Kaisha: *See*—
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Killian, Robert J.; and Sproul, Nolte V., to Aspro, Inc. Spinner loader equipment. 3,910,423, Cl. 214-1.0BB.
Kim, Dong H.; and Santilli, Arthur A., to American Home Products Corporation. 4,5-Diamino-7H-pyrrolo[2,3-d]pyrimidine derivatives. 3,910,913, Cl. 260-256.40N.
Kim, Nak Yang. Artificial hair and method for manufacturing the same. 3,910,291, Cl. 132-53.000.
Kimata, Osamu; and Furuya, Hitoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Brake for automobiles provided with electromagnetic cut-off valves. 3,910,642, Cl. 303-84.00A.
Kimura, Kazuo: *See*—
Arai, Yoshi; Kinoshita, Shoichi; and Kimura, Kazuo, 3,910,682.
Kimzey, Gene A. Variable time delay voltage dropout detector. 3,911,360, Cl. 324-133.000.
Kinedyne Corporation: *See*—
Brucker, Henry J.; and Brucker, Robert J., 3,910,558.
King, John O., Jr. Tubing severing tool. 3,910,474, Cl. 225-96.500.
King-Seeley Thermos Co.: *See*—
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Kings Electronic Company, Inc.: *See*—
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Kirk, Norbert A. Glider toy. 3,909,976, Cl. 46-79.000.
Kirk, Norbert A. Noise-making clapper. 3,909,977, Cl. 46-191.000.
Kisaki, Hisashi: *See*—
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Kishi, Hajimu; and Momo, Kazushige, to Oki Electric Industry Co., Ltd. Pulse interpolation system. 3,911,258, Cl. 235-151.110.
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Klee, Rudolf Jurgen: *See*—
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Klingler, Karl Heinz; and Habersang, Silke, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. N-fluoroalkylated phenylethylamine. 3,911,016, Cl. 260-570.80R.
Klipec, Bruce E.: *See*—
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Knecht, Fritz, to Tecmed A.G. Apparatus for grinding a knife including knife holding and guiding means. 3,909,985, Cl. 51-124.00R.
Kneusel, Raymond H. P.; and Potts, Vinson S., to Crown Cork & Seal Company, Inc. Easy opening can end with push-in tabs. 3,910,453, Cl. 220-260.000.
Knight, Alan Campbell, to Du Pont de Nemours, E. I., and Company. Tube shaping apparatus. 3,910,745, Cl. 425-387.00R.
Knighton, David R. Apparatus for recovering silver from photographic film processing liquids. 3,910,833, Cl. 204-273.000.
Knowles, Richard Norris, to Du Pont de Nemours, E. I., and Company. Salts of antimony (V) esters as flame retardants. 3,910,977, Cl. 260-429.900.

Ko Kondo: *See—*
Kondo, Ko; Ito, Takashi; and Ohtomo, Koichiro, 3,910,799.

Kobashi, Uichiro; Inada, Masami; and Takayama, Katsuki, to Aisin Seiki Kabushiki Kaisha. Anti-skid brake control system for a wheeled vehicle. 3,910,643, Cl. 303-21.00F.

Kobayashi, Kazutsugu: *See—*
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Kobayashi, Kei: *See—*
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Kobayashi, Shinzo; and Ohta, Takahisa, to Mitsubishi Denki Kabushiki Kaisha. Data transmission system. 3,911,396, Cl. 340-147.0SC.

Kobylinksi, Tadeusz P.; and Taylor, Brian W., to Gulf Research & Development Company. Catalytic converter. 3,910,770, Cl. 23-288.0FB.

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Kikugawa, Kiyomi; Suehiro, Hideo; Iizuka, Kazuhiro; Sugata, Leiko; Ichino, Motonobu; and Nakamura, Tokuro, 3,910,884.

Kohler, Franz, to Ersa Ernst Sachs KG. De-soldering apparatus. 3,910,479, Cl. 228-20.000.

Koike, Shin-Ichi, to Nippon Electric Company Limited. Code error monitoring system. 3,911,395, Cl. 340-146.1AB.

Koita, Yusuf Taher: *See—*
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Kojima, Koichi: *See—*
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Kolb, Alfred E.; and Nyffenegger, Willy, to Dictaphone Corporation. Dual media transcribing apparatus. 3,911,482, Cl. 360-15.000.

Kolomayets, George: *See—*
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Komisarek, Joseph A. Leaching system cavity of preformed components. 3,910,051, Cl. 61-11.000.

Komiya, Kyoko: *See—*
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Kondo, Eiichi; and Inoue, Shozo, to Canon Kabushiki Kaisha. Color reproduction device. 3,910,232, Cl. 118-637.000.

Kondo, Ko; Ito, Takashi; and Ohtomo, Koichiro, to Kanebo, Ltd.; and Ko Kondo, part interest to each. Lead-acid storage battery having improved separators. 3,910,799, Cl. 136-145.000.

Konoki, Kyoji; Murai, Norisuke; and Kogawa, Sumio, to Kikusui Kagaku Kogyo Kabushiki Kaisha. Apparatus for automatically crimp crowning lids on cans. 3,910,212, Cl. 113-18.00B.

Konopnicki, Daniel T.: *See—*
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Konrad, Eugen: *See—*
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Kooi, Else; and Van Gils, Johannes Antonius Andress, to U.S. Philips Corporation. Semiconductor device and method of manufacturing same. 3,911,471, Cl. 357-50.000.

Kopernik, Dror, to Turner Mfg. Co. Plastic mold construction. 3,910,748, Cl. 425-444.000.

Kormendi, Kalman: *See—*
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Korta, Lawrence B.; and Seaks, Charles E., Jr., to Johnson Service Co. Split beam antenna apparatus for developing angularly oriented beams. 3,911,443, Cl. 343-767.000.

Koshiba, Masao: *See—*
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Kostin, Boris Mikhailovich; Lapin, Boris Grigorievich; Saburov, Vladimir Alexandrovich; Sheikhetov, Vladimir Iosifovich; and Suvorov, Sergei Ivanovich. Head drum structure for video tape recorder. 3,911,490, Cl. 360-84.000.

Kotaka, Yasumasa, to AMP Incorporated. Keyboard type switch assembly having fixed and movable contacts disposed on foldable flexible printed circuit board. 3,911,234, Cl. 200-5.00A.

Kouklik, Ivo: *See—*
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Kowada, Giichiro: *See—*
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Kowal, Krzysztof; and Malone, Leon S., Jr., to Honeywell Information Systems, Inc. Data processing interface system. 3,911,409, Cl. 340-172.500.

Kozakai, Asao; Ishikawa, Masakazu; Ota, Takaaki; and Ito, Sadayoshi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic braking system. 3,910,640, Cl. 303-6.00C.

Kracklauer, John J., to Syntex (U.S.A.) Inc. Preparation of B-stage unsaturated polyester resins. 3,911,049, Cl. 260-863.000.

Kraftwerk Union Aktiengesellschaft: *See—*
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Kramer, David N.: *See—*
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Kramer, Hyman. Webbing strip-to-tubular frame member fastenings. 3,910,339, Cl. 160-404.000.

Krapcho, John; and Turk, Chester Frank, to E. R. Squibb & Sons, Inc. Pyrazolo-pyridine biologically active compounds. 3,911,129, Cl. 424-256.000.

Kratky, Otto; Leopold, Hans; and Stabinger, Hans. Devices for measuring density. 3,910,101, Cl. 73-32.00A.

Kraus, Charles Edward, to Excelermatic, Inc. Hydrostatic axial thrust bearing. 3,910,650, Cl. 308-9.000.

Krause, Erich; and Schieber, Hans, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Process and a device for holding the end of the thread on straight knitting machines. 3,910,073, Cl. 66-145.00S.

Krause, Erich: *See—*
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Krebser, Rudolf: *See—*
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Kreider, Eunice M., to G. D. Searle & Co. [2-(2-Methyl-5-nitro-1-imidazolyl)ethyl]benzo(b)pyridyloxy ethers. 3,910,925, Cl. 260-288.00R.

Kreider, Eunice M., to G. D. Searle & Co. 2-(2-Methyl-5-nitro-1-imidazolyl)ethyl-N-arylalkyldithiocarbamates. 3,910,945, Cl. 260-309.000.

Kreighbaum, William Eugene; and Comer, William Timmey, to Mead Johnson & Company. 3-Hydroxyisoquinoline ethers. 3,910,927, Cl. 260-289.00R.

Krekeler, Claude B., to Cincinnati Mine Machinery Company, The. Joint assembly for disconnecting a segmented cutter bar. 3,910,709, Cl. 403-8.000.

Krezanoski, Joseph Z., to Flow Pharmaceuticals, Inc. Iodine composition and dissipating solution. 3,911,107, Cl. 424-78.000.

Krieger, Bernhard; Hempel, Gerhard; and Kaspar, Emanuel, to Schering Aktiengesellschaft. Method of preparing 4-chloro-derivatives of phenylformamidine and salts thereof. 3,911,012, Cl. 260-564.0RF.

Krienke, Robert D.; Head, Johnny W.; Hoffman, Harold C.; and Turns, Earl W., to General Dynamics Corporation. Solid film lubricant and method for lubricating cycling low-high temperature friction surfaces. 3,910,774, Cl. 29-183.500.

Krimsky, Leonard C.: *See—*
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Krings, Josef. Sheeting arrangement for shoring a trench with a graduated cross section. 3,910,053, Cl. 61-41.00A.

Krings, Josef. Sheeting arrangement for sheeting of a ditch. 3,910,054, Cl. 61-41.00A.

Kristen, Reiner; Liska, Manfred; Tschirner, Peter; and Kuhnlein, Hans, to Siemens Aktiengesellschaft. High speed commutatorless D.C. motor. 3,911,299, Cl. 310-64.000.

Krivec, Bert, to Rexnord Inc. Chain-driven dog. 3,910,198, Cl. 104-172.00B.

Krohn, Henry W., to Eaton Corporation. Inflation and pressure change indication device. 3,910,223, Cl. 116-70.000.

Kroon, William L., to Ampex Corporation. Method of manufacturing a multitrack magnetic head. 3,909,932, Cl. 29-603.000.

Krozal, William. Cutting tool for parting or grooving a workpiece. 3,909,896, Cl. 29-95.00R.

Kruger, Jack L. Gas barrier. 3,911,197, Cl. 174-28.000.

Kruger, Martin: *See—*
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Kruka, Vitold R.; and Meier, Dale J., to Shell Oil Company. Process of reducing friction loss in flowing hydrocarbon liquids and compositions thereof. 3,910,856, Cl. 260-33.6AQ.

Krutzner, Karl, Jr.: *See—*
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McLean, Peter; Jenkins, Stephen R.; and Ku, Victor, 3,911,402.

Kubalek, Miroslav. Pressing tool for preparing work pieces. 3,910,097, Cl. 72-354.000.

Kubokura, Kuniaki, to Hitachi, Ltd. Driving system for a sewing machine. 3,910,211, Cl. 112-219.00A.

Kubota, Takubi: *See—*
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Kubota, Toshihiro; and Terashima, Toshikatu, to Nakajima All Kabushiki Kaisha. Carriage shift mechanism for an electric typewriter. 3,910,398, Cl. 197-73.000.

Kubovich, Frank Steve: *See—*
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Kulka, Kurt, to Fritzsche Dodge & Olcott Inc. 1,1,4,4-Tetra methyl-alkyl-nitriles-tetrahydronaphthalene perfume compositions. 3,910,853, Cl. 252-522.000.
Kume, Yoshiharu: *See—*
Akatsu, Mitsuhiro; Kume, Yoshiharu; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; Izumi, Takahiro; Inaba, Shigeho; and Yamamoto, Hisao, 3,910,889.
Kummel, Ulrich; and Mair, Manfred, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. Electrode comprising a porous sintered body. 3,911,309, Cl. 313-346.00R.
Kunkel, George M. Wound transformers and machine for making the same. 3,911,332, Cl. 317-157.620.
Kunst, Robert J. Reinforced step well. 3,910,201, Cl. 105-443.000.
Kurimoto, Mikishi; and Takegawa, Hiroyasu, to Toyoda Koki Kabushiki Kaisha. Numerically controlled machine tool with miscellaneous function control circuit to reduced unproductive periods to a minimum. 3,909,923, Cl. 29-568.000.
Kurisawa, Konomu: *See—*
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Kurochkin, Fedor Filippovich: *See—*
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Kurokawa, Kaneyuki: *See—*
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Kusakawa, Yoshinari. Stringed musical instrument having an attachment for changing musical key. 3,910,152, Cl. 84-307.000.
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Kyncl, Jaroslav: *See—*
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La Cellophane: *See—*
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La Nationale S.A.: *See—*
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La Telemecanique Electrique: *See—*
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Laboue, Bernard Andre; and Qu'Hen, Rene, to Compagnie Honeywell Bull. Device for supporting flat electrical cables. 3,910,537, Cl. 248-68.0CB.
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Lackner, Robert, to U.S. Philips Corporation. Color video tape recorder utilizing a color subcarrier oscillator as an erasing signal. 3,911,477, Cl. 358-4.000.
Ladriere, Serge. Magnetic tape playback unit which sequentially switches between four tracks by detecting end of track silence. 3,911,487, Cl. 360-63.000.
Lafferty, James M., to General Electric Company. Vacuum arc devices with non-welding contacts. 3,911,239, Cl. 200-144.00B.
Lagasse, Guy. Plumb light. 3,909,952, Cl. 33-227.000.
Laird, Joseph W., to United States of America, Agriculture. Air jet nozzle assembly. 3,910,504, Cl. 239-543.000.
LaLande, William Alfred, Jr.; Hauptschein, Murray; and Hager, Robert Bonner, to Pennwalt Corporation. Novel hexafluorohexenes. 3,911,035, Cl. 260-653.10R.
Lamberti, Vincent, to Lever Brothers Company. Sulfosuccinate derivatives of carbohydrates. 3,910,880, Cl. 260-210.00R.
Lambrecth, Dietrich, to Kraftwerk Union Aktiengesellschaft. Method for securing winding bars in slots of electric generators. 3,909,931, Cl. 29-596.000.
Lamer, Gerald P.; and Seeley, Ronald D., to J. I. Case Company. Dragline arrangement for telescopic hydraulic crane. 3,909,961, Cl. 37-116.000.
Lampson, Butler W., to Xerox Corporation. Display system including a high resolution character generator. 3,911,420, Cl. 340-324.0AD.
Lampson, Butler W.: *See—*
Bates, Roger D.; and Lampson, Butler W., 3,911,419.
Landgreen, Eleanor A.: *See—*
McCartney, Ronald L.; and Landgreen, Eleanor A., 3,910,678.
Landrum, Leon L.; and Holder, Robert L., to Esquire, Inc. Light fixture. 3,911,265, Cl. 240-52.00R.
Lang, Konrad: *See—*
Widauer, Josef Olav; Lang, Konrad; Baum, Laszlo; and Szabo, Suzanne, 3,910,888.
Langdon, Glen G., Jr.: *See—*
Giannuzzi, Robert J.; Langdon, Glen G., Jr.; and Pasternak, Edward, 3,911,424.
Lange, Elisabeth Hedwig, heiress-at-law: *See—*
Lange, Guenter, deceased, 3,910,874.
Lange, Guenter, deceased (by Lange, Elisabeth Hedwig, heiress-at-law), to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Water-insoluble thiazole and thiadiazole azo dyestuffs. 3,910,874, Cl. 260-158.000.
Langford, Richard. Form-work with stake mounting means. 3,910,545, Cl. 249-7.000.
Langseth, Rollin Edward; and Yeh, Yu Shuan, to Bell Telephone Laboratories, Incorporated. Cophasing combiner with cochannel signal selector. 3,911,364, Cl. 325-301.000.
Lanker, Willi, to Turlabor A.G. Process and apparatus for regenerating a photoconductive layer. 3,910,697, Cl. 355-17.000.
Lapin, Boris Grigorievich: *See—*
Kostin, Boris Mikhailovich; Lapin, Boris Grigorievich; Saburov, Vladimir Alexandrovich; Sheikhetov, Vladimir Iosifovich; and Suvorov, Sergei Ivanovich, 3,911,490.
Larkin, William A.; Ringwood, Robert C., Jr.; and Treadwell, Kenneth, to M & T Chemicals Inc. Novel process and product. 3,910,858, Cl. 260-42.490.
Larrivee, Jerry J., Jr.: *See—*
Guastella, Samuel L.; and Larrivee, Jerry J., Jr., 3,911,191.
Lasky, Daniel J.; Puder, Allen T.; Wright, Philip Richard; and Oiye, George, to ILC Technology, Inc. Apparatus and method for automatically processing a batch of photographic elements. 3,911,460, Cl. 354-328.000.
Lasoen, Jean J.: *See—*
Elfes, Lee E.; Mueller, Otto, Jr.; and Lasoen, Jean J., 3,910,355.
Lasserre, Roger; and Darrieussecq, Jean-Pierre, to Societe Anonyme des Fonderies et Ateliers de Mousserolles. Grinding device for removing cast metal projections from foundry castings. 3,909,983, Cl. 51-96.000.
Lattin, William W., to Motorola, Inc. Digitally controllable enhanced capacitor. 3,911,466, Cl. 357-23.000.
Lautenberger, William Jacob: *See—*
Froehlich, Helmut H.; and Lautenberger, William Jacob, 3,910,848.
Lavanish, Jerome M., to PPG Industries, Inc. Herbicidal benzyl alcohols. 3,911,029, Cl. 260-618.00R.
Lavedan, Louis J., Jr., to United States of America, Navy. Insertion phase trim method. 3,911,380, Cl. 333-31.00A.
Lawrence, Gerald Norman; and Ward, Martin. Telecommunication exchange apparatus for translating semi-permanent channel information. 3,911,227, Cl. 179-18.0ES.
Lawrence Peska Associates, Inc.: *See—*
Zamorski, Theodore R., 3,910,377.
Lay, Frank M.: *See—*
McDowell, Allen W.; and Lay, Frank M., 3,911,422.
Leane, John Bryant; and Higham, Peter, to Perkin-Elmer Limited. Nmr spectrometer probe with eddy current brake. 3,911,355, Cl. 324-.5AH.
Lear Siegler, Inc.: *See—*
Tersch, Richard W., 3,909,990.
Lebedev, Viktor Fedorovich; Zaitsev, Anatoly Petrovich; Kvin, Pavel Fishelevich; Shuboderov, Viktor Mikhailovich; Piljus, Vladimir Grigorievich; Filimonova, Nina Nikodimovna; and Suslakova, Svetlana Ivanovna. Method of brazing refractory metals and compounds based thereon. 3,909,917, Cl. 228-216.000.
Lebkuchner, Benno, to Taco, Inc. Encapsulated wet dynamoelectric machine rotor. 3,911,300, Cl. 310-86.000.

Lederman, Burton E.; and Reilly, John J., to Conshohocken Chemicals, Inc. Conductive resin composition. 3,910,852, Cl. 252-512.000.

Ledford, William T.: *See—*
Sthare, Derwin K.; and Ledford, William T., 3,910,759.

Ledig, Kurt W.: *See—*
Herbst, David R.; and Ledig, Kurt W., 3,911,130.

Lee, Arthur L. Electric motor. 3,911,305, Cl. 310-241.000.

Lee, Frank X.; Krimsky, Leonard C.; and Freytag, Donald R., to Worldwide Converting Machinery, Inc. Web tension control system. 3,910,522, Cl. 242-75.530.

Lee, George Y. Wax burner. 3,910,753, Cl. 431-290.000.

Lee, Hsing-San: *See—*
Chang, Wen Hsing; and Lee, Hsing-San, 3,911,464.

Lee, Hua-tung, to International Business Machines Corporation. Hierarchial memory/storage system for an electronic computer. 3,911,401, Cl. 340-172.500.

LeFevre, Cecil W.: *See—*
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Leibrecht, Klaus; and Jahn, Helmut, to Kalle Aktiengesellschaft. Method and an apparatus for automatically adding cycles with varying ratings. 3,911,254, Cl. 235-92.0PD.

Leichliter, Wayne K.: *See—*
Detty, Rodney H.; and Leichliter, Wayne K., 3,910,391.

Leider, Philip J.; and Rihs, Jorg, to Westvaco Corporation. Open discharge pulp refiner. 3,910,511, Cl. 241-261.300.

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Hull, Clifford O., Jr.; Leinweber, Leland F.; Sahm, William H., III; and Sprague, James W., 3,911,463.

Leland, Ragnvald G. Cleaning device with squeegee adapter. 3,909,870, Cl. 15-121.000.

Lemahieu, Raymond Gerard: *See—*
Janssens, Wilhelmus; Claeys, Daniel Alois; Lemahieu, Raymond Gerard; and Dierckx, Jozef Aime, 3,911,171.

Lemahieu, Ronald Andrew: *See—*
Kierstead, Richard Wightman; and Lemahieu, Ronald Andrew, 3,911,026.

Lemelson, Jerome H. Tooth cleaning implement. 3,910,293, Cl. 132-89.000.

Lennox, William Murdoch, to National Research Development Corporation. Endoprosthetic wrist joint. 3,909,853, Cl. 3-1.910.

Leomand, Gerard, to Societe Nationale Industrielle Aerospatiale. Shell-type structure for light aircraft. 3,910,531, Cl. 244-119.000.

Leonard, Frank R.: *See—*
Whidden, Roger W.; Leonard, Frank R.; Rosenthal, Sidney; and Fitzpatrick, Richard O., 3,910,189.

Leonard, James H.: *See—*
Venzke, Donald R.; Wiseman, James L.; Isaac, Donald, Jr.; and Leonard, James H., 3,911,235.

Leonhart, Xaver. Billiard table with pivotably mounted playing surface support frame. 3,910,576, Cl. 273-3.00C.

Leonhart, Xaver. Table ball game with moveable circular bumper portions. 3,910,580, Cl. 273-119.00A.

Leopold, Hans: *See—*
Kratky, Otto; Leopold, Hans; and Stabinger, Hans, 3,910,101.

Lepper, Herbert: *See—*
Zeidler, Ulrich; and Lepper, Herbert, 3,910,975.

Lesaicherre, Andre; and Linguenheld, Louis, to Rhone-Poulenc S.A. Process for improving the adhesion of coating made of photoresistant polymers to surfaces of inorganic oxides. 3,911,169, Cl. 427-96.000.

Leshnoff, Stephen D.: *See—*
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Lester, George W.: *See—*
Bloch, Herman S.; Illingworth, George E.; and Lester, George W., 3,910,994.

Leummens, Karel Martin Hubert: *See—*
Coenen, Renier Gertruda Hubertus; Leummens, Karel Martin Hubert; and Swaving, Erland Charles Justus, 3,911,312.

Leutwyler, Roy: *See—*
Jureit, John Calvin; Leutwyler, Roy; Brodsky, Larry; Kushner, Benjamin; and Castillo, Adolfo, 3,910,512.

Levante, Gregoire: *See—*
Thimon, Hubert A.; and Levante, Gregoire, 3,910,005.

Leveen, Harry H. Process for treatment of ascites and device to accomplish same. 3,910,283, Cl. 128-350.00V.

Lever Brothers Company: *See—*
Kenworthy, Raymond; and Porter, Philip, 3,911,109.
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Levine, Peter Alan; and Carnes, James Edward, to RCA Corporation. Interlaced readout of charge stored in charge-coupled image sensing array. 3,911,467, Cl. 357-24.000.

Levine, Seymour D., to E. R. Squibb & Sons, Inc. Isoindolo [7,1,2,-hij] quinolines). 3,910,923, Cl. 260-287.00P.

Levine, Seymour D., to E. R. Squibb & Sons, Inc. Isoindolo [7,1,2-hij]quinolines. 3,910,926, Cl. 260-289.00C.

Levy, Ezra: *See—*
Nussim, Manasse; Levy, Ezra; and Naiman, Jacob, 3,910,984.

Levy, John V.; Jenkins, Stephen R.; Ku, Victor; McLean, Peter; and Hastings, Thomas N., to Digital Equipment Corporation. Drive condition detecting circuit for secondary storage facilities in data processing systems. 3,911,400, Cl. 340-172.500.

Lewis, John C., Jr., to Tucel Industries, Inc. Filament picking apparatus. 3,910,637, Cl. 300-2.000.

Libbey-Owens-Ford Company: *See—*
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Liberty, Jean C.: *See—*
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Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
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Harth, Wolfgang; and Muller, Jorg, 3,911,382.
Maurer, Robert; and Locherer, Karl-Heinz, 3,911,365.

Lieberman, Abraham Buddy. Load-supporting pallets. 3,911,182, Cl. 428-12.000.

Liebs, Peter: *See—*
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Liebscher, Anton: *See—*
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Lin, Stephen Y., to Westvaco Corporation. Production of water-soluble polycarboxylic lignin by an oxygen-alkali process. 3,910,873, Cl. 260-124.00R.

Lindberg, Ulf Hendrik Anders; and Akerman, Sven Bengt Arvid, to Astra Lakemedel Aktiebolag. Novel glycylglycine amides. 3,910,871, Cl. 260-112.500.

Lindblom, Robert O.: *See—*
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Linde Aktiengesellschaft: *See—*
Jakob, Fritz, 3,910,777.
Rottmayr, Friedrich; Reimann, Hans; Schuster, Robert; Wagner, Walter; and Muller, Hans Joachim, 3,911,082.

Lindenschmidt, Robert E., to Whirlpool Corporation. Refrigeration apparatus enclosure structure. 3,910,658, Cl. 312-214.000.

Linder, Jacques F., to Texas Instruments Incorporated. Electron multiplier and method of making same. 3,911,167, Cl. 427-87.000.

Linder, Jerome, to Sandoz, Inc. Preparation of morphanthridin-6-(5H)-ones. 3,910,890, Cl. 260-239.30T.

Lindner, Ernst: *See—*
Haede, Werner; Fritsch, Werner; Stache, Ulrich; and Lindner, Ernst, 3,910,882.

Lindner, Henry. Means for storing bicycle security cable. 3,910,602, Cl. 280-289.000.

Linguenheld, Louis: *See—*
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Linz, Arthur: *See—*
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Isa, Hiroshi; Inomiya, Takeshi; Karube, Kenji; Takemoto, Takeshi; and Nagayama, Masuzo, 3,910,973.

Lipanovich, Marko I.: *See—*
United States of America, National Aeronautics and Space Administration; Cleveland, Garry J.; Loh, George M.; Luce, Robert S.; Belasco, Norman; Lipanovich, Marko I.; Petersen, Howard L.; Pool, Sam L.; and Mangold, Donald W., 3,910,257.

Lisenbee, Wayne F.: *See—*
Crandell, William H.; Lisenbee, Wayne F.; and Nelson, Keith E., 3,910,278.

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Kristen, Reiner; Liska, Manfred; Tschirner, Peter; and Kuhnlein, Hans, 3,911,299.

Litman, Marvin W. Hair setting roller and method of use. 3,910,290, Cl. 132-39.000.

Little, James Arthur: *See—*
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Little, Norman G.: *See—*
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Litton Industrial Products, Inc.: *See—*
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Ljukimson, Girgory Mikhailovich: *See—*
Chemeris, Oleg Nikolaevich; Tretyakov, Evgeny Vasilievich; Didkovsky, Viktor Kirillovich; Kanfer, Vilen Davidovich; Paschenko, Nikolai Konstantinovich; Zeltser, Izmail Grigorievich; Ljukimson, Girgory Mikhailovich; Bashkatov, Alexandr Nikolaevich; Melnikov, Boris Nikolaevich; Medzhibozhsky, Miron Yakovlevich; Goldberg, Ilya Alexandrovich; Juzefovsky, Izrail Abramovich; Ratmansky, Rafail Davidovich; Irkha, Viktor Nikolaevich; Borisov, Jury Nikolaevich; and Kurochkin, Fedor Filippovich, 3,911,175.

Lloyd, Richard J., to Garrett Corporation, The. Fuel trap evacuation system. 3,910,049, Cl. 60-605.000.

Locherer, Karl-Heinz: *See—*
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Lockwood, Norman: *See—*
Cowley, Ronald W.; Hallwood, Reginald; and Lockwood, Norman, 3,910,010.

Loeffler, Herbert H., to Ciba-Geigy Corporation. Product pressurized compressed air dispenser. 3,910,465, Cl. 222-193.000.

Loeffler, Robert I.; and Higginbottom, Lonnie C., to University Engineers, Inc. Face seal structure. 3,910,587, Cl. 277-63.000.

Loeliger, Peter: *See—*
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Loev, Bernard, to SmithKline Corporation. 5-Heterocyclic-1,2,3,6-tetrahydro-4(5H)-pyrimidinethiones and pyrimidinone intermediates therefor. 3,910,914, Cl. 260-256.50R.

Loev, Bernard: *See—*
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Loh, George M.: *See—*
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Lohmer, Karl; von Konig, Anita; and Muller, Anneliese, to Agfa-Gevaert Aktiengesellschaft. Color photographic materials processed in the presence of anti-color fogging agents. 3,910,790, Cl. 96-56.000.

Long, Don Wesley: *See—*
Stepek, Walter Joseph; Garber, Murray; and Long, Don Wesley, 3,910,949.

Long, Robert E., Jr.: *See—*
Martin, Brice E.; Ritsko, Joseph E.; and Long, Robert E., Jr., 3,911,077.

Long, Roger D.: *See—*
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Longwood Machine Works, Incorporated: *See—*
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Loop-A-Line, Inc.: *See—*
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Lorenz, Horst; and Gerhardt, Gunter, to TH. Kieserling & Albrecht. Machine for straightening of round bars or tubes. 3,910,088, Cl. 72-98.000.

Lorenz, Horst, to TH. Kieserling & Albrecht. Two-high roll stand with roll adjusting and overload prevention mechanism. 3,910,090, Cl. 72-245.000.

Lorenz, Walter; Jautelat, Manfred; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. O-alkyl-O-(1-cyano-1-tert.-butylketoxime)-thionophosphoric (phosphonic) acid esters. 3,911,055, Cl. 260-940.000.

Lou, David Yuan Kong; Watson, Hugh Alexander; and Willens, Ronald Howard, to Bell Telephone Laboratories, Incorporated. Metal film recording media for laser writing. 3,911,444, Cl. 346-1.000.

Lough, David Royle. Location means for rafter on columns. 3,910,002, Cl. 52-283.000.

Love, Richard R. Vehicle having front end loader. 3,910,433, Cl. 214-75.00R.

Lownes, Kenneth: *See—*
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Lowry, Robert W.: *See—*
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Lucas Electrical Company Limited: *See—*
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Luce, Robert S.: *See—*
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Lukacs, Michael Edward: *See—*
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Lundsager, Christian Bent, to W. R. Grace & Co. Profile extension process for thermoplastic resins and ceramic thermoplastic resin binder compositions. 3,911,070, Cl. 264-44.000.

Lusztig, Gavril T., to Webster Electric Company, Inc. Gerotor pump or motor. 3,910,732, Cl. 418-60.000.

Luthi, Christian: *See—*
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Luttgert, Hans; Brunk, Karl; Dietrich, Johannes; and Pahl, Emanuel, to Siemens Aktiengesellschaft. Method and apparatus for forming integral coupling flanges in hollow metallic articles. 3,910,094, Cl. 72-342.000.

Lutze, Siegfried; Birnkraut, Hans-Walter; and Moser, Hubert, to Ruhrchemie Aktiengesellschaft. Process for the polymerization of alpha olefins. 3,910,870, Cl. 260-94.90B.

Luybli, Richard E.: *See—*
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M & T Chemicals Inc.: *See—*
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Mabuchi, Shunsuke: *See—*
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MacCarthy, Donald W., Sr. Idler pulley adjustment device. 3,909,987, Cl. 51-148.000.

MacCracken, Calvin D., to Calmac Manufacturing Corporation. Method and system for providing an ice slab while preventing undue freezing penetration below. 3,910,059, Cl. 62-99.000.

MacEwen, Ralph Miller; and Beldam, Richard Paul, to Fram Corporation. Limited deflection flexible bladed fan for use with viscous shear clutch. 3,910,718, Cl. 416-132.000.

MacGovern, Alan John, to Itek Corporation. Laser scanning apparatus. 3,910,675, Cl. 350-7.000.

Mach, Wolfgang: *See—*
Scheuermann, Horst; Augart, Dietmar; and Mach, Wolfgang, 3,910,912.

Machan, Frank P. Heavy implement trailer. 3,910,436, Cl. 214-506.000.

Machida, Junichi: *See—*
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Mack, Phillip R. Signal handle for valves. 3,910,308, Cl. 137-553.000.

MacKichan, Hugh Gerald: *See—*
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MacMaster, Edward, to Rex Chainbelt Inc. Self-compensating adjustable keeper. 3,910,669, Cl. 339-75.00R.

MacMillan, Kenneth T. Method of maintaining proper rotational characteristics of a radial tire. 3,909,906, Cl. 29-407.000.

Macrander, Karl; and Kessel, Heinrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Bridge crane girder. 3,909,863, Cl. 14-17.000.

Madden, Allan C.: *See—*
Curchod, Donald B.; and Madden, Allan C., 3,910,121.

Maecker, Kurt. Digital incremental emitter, especially for numerical control of machine tools. 3,911,399, Cl. 340-164.00R.

Magne, Frank C.: *See—*
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Magrini, Guido, to Fiat Societa per Azioni. Instrument panel for motor vehicles. 3,910,371, Cl. 180-90.000.

Mahara, Masamichi; Suzuki, Shoichi; and Yanagida, Yasuji, to Asahi Glass Co., Ltd. Automatic plate piling apparatus. 3,910,425, Cl. 214-6.0DK.

Mahieu, Yves, to Societe Anonyme dite: Ateliers Mecaniques du Douaisis. Passenger loading ramp. 3,910,264, Cl. 182-63.000.

Mahnig, Fritz: *See—*
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Mair, Manfred: *See—*
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Maitenaz, Bernard F., to Essilor International. Ophthalmic lenses with progressively varying focal power. 3,910,691, Cl. 351-169.000.

Makar, Francis B., Jr., to GTE Sylvania Incorporated. Electrode for arc discharge lamp. 3,911,313, Cl. 313-346.00R.

Malleck, Joseph W.: *See—*
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Mameniskis, Walter A.: *See—*
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Maness, Roy F.; Moore, Raymond H.; and Rohrmann, Charles A., to Battelle Memorial Institute. Catalytic oxidation of nitric oxide in molten salt. 3,911,081, Cl. 423-210.500.

Mangold, Donald W.: *See—*
United States of America, National Aeronautics and Space Administration; Cleveland, Garry J.; Loh, George M.; Luce, Robert S.; Belasco, Norman; Lipanovich, Marko I.; Petersen, Howard L.; Pool, Sam L.; and Mangold, Donald W., 3,910,257.

Manor, Paul A., to Rockwell International Corporation. Hydraulic valve operator and remote control. 3,910,497, Cl. 239-127.000.

Mantey, John P.: *See—*
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Marathon Oil Company: *See—*
Tackett, James E.; and Stewart, Paul H., 3,910,299.

Marc Conraux, Claude Charles; Despringre, Alain; Kaphan, Gerard; and Max, Jacques, to Commissariat a l'Energie Atomique. Device for cumulating the useful sections of a signal appearing in the form of a series of pulses each having a useful section. 3,911,329, Cl. 328-14.000.

Marconi Company Limited, The: *See—*
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Marcoux, Emery. Insulating jacket for drinking utensils. 3,910,328, Cl. 150-52.000.

Mardon, Austin; and Prestwood, Franklin H. Dual frequency radiometer. 3,911,435, Cl. 343-100.0ME.

Marechal, Robert Rene, to SICMA - Societe Industrielle et Commerciale de Material Aeronautique. Multi-place seats. 3,910,632, Cl. 297-232.000.

Marforio, Nerino, to Virginio Rimoldi & C. S.p.A. Universal support for the needle cooling group of a sewing machine. 3,910,210, Cl. 112-218.00R.

Marion, Jean-Paul, to Societe d'Assistance Technique pour Produits Nestle S.A. Method of enhancing tea flavor and aroma, and product thereof. 3,911,145, Cl. 426-597.000.
Markfelt, Reinhold S., to Universal Oil Products Company. Electronic water level indicator. 3,909,948, Cl. 33-126.500.
Markovitch, Branko, to Simmons, Samuel P. Sliding link safety latch. 3,910,615, Cl. 292-263.000.
Markovitch, Branko, to Simmons, Samuel P. Pivoting link safety latch. 3,910,616, Cl. 292-283.000.
Maroschak, Ernest J. Method for making corrugated plastic tubing. 3,910,713, Cl. 408-1.000.
Marosi, Laszlo; Ripperger, Willi; and Schwarzmann, Matthias, to BASF Aktiengellschaft. Process for the manufacture of crystalline berylloaluminosilicates. 3,911,088, Cl. 423-329.000.
Marsh, Douglas D., to Garrett Tubular Products, Inc. Swivel chair with lockable swiveling mechanism. 3,910,633, Cl. 297-349.000.
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Martinez, Ysidore M. Knee implant prosthesis. 3,909,854, Cl. 3-1.911.
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Maruyama, Yoshio; and Fushimi, Akihiro, to Pioneer Electronic Corporation. Cassette tape player start-up mechanism. 3,911,495, Cl. 360-96.000.
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Maurer, Robert; and Locherer, Karl-Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Narrowband receiving system with improved signal to noise ratio. 3,911,365, Cl. 325-346.000.
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McCartney, Ronald L.; and Landgreen, Eleanor A., to International Telephone and Telegraph Corporation. Fiber optic tubular star connector. 3,910,678, Cl. 350-96.00C.
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Mignon, Guy, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Method and device for checking and adjusting a PCM transmission device. 3,911,225, Cl. 179-15.0BF.

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Miyabayashi, Yoshiyuki; Takizawa, Hideo; Tsuneishi, Norihiro; and Aida, Hiroyuki, to Nissan Motor Company Limited. Method of joining the edge portions of two sheets. 3,909,919, Cl. 29-521.000.

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Miyamoto, Akira: *See—*
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Miyazawa, Shinichi; Takeyama, Hidehiko; and Miyasaka, Kaneyoshi, to Agency of Industrial Science & Technology. Apparatus for grinding cylindrical workpieces. 3,909,986, Cl. 51-138.000.

Mizusawa, Motoo, to Mitsubishi Denki Kabushiki Kaisha. Antenna feed system. 3,911,440, Cl. 343-755.000.

Mobil Oil Corporation: *See—*
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Moczygemba, George A.; and Hsieh, Henry L., to Phillips Petroleum Company. Increasing inherent viscosity of copolymers. 3,910,868, Cl. 260-89.50S.

Mod, Robert R.; Magne, Frank C.; Sumrell, Gene; Novak, Arthur F.; and Solar, James M., to United States of America, Agriculture. 1,3-Diacyl derivatives of imidazolidine. 3,910,948, Cl. 260-309.700.

Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., to United States of America, Agriculture. Phosphonated N,N-disubstituted fatty amides as bactericidal and fungicidal agents. 3,911,120, Cl. 424-211.000.

Moffatt, John G.; and Verheyden, Julien P. H., to Syntex (U.S.A) Inc. 4-Alkoxy nucleosides and intermediates therefore. 3,910,885, Cl. 260-211.50R.

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Monroy, Heliodoro. 1,2-Dihydroquinolines and process and apparatus for the obtention thereof. 3,910,918, Cl. 260-283.0SY.

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Montiglio, Ugo; Basile, Giampiero; Aspes, Pierfrancesco; and Foco, Luigi, to Montecatini Edison S.p.A. Preparation of ferromagnetic chromium dioxide having granulometric and magnetic characteristics varying within wide limit as well as a new chromium dioxide of particular granulometric characteristics. 3,911,095, Cl. 423-607.000.

Montijn, Paulus P.; and Mulder, Albertus J., to Shell Oil Company. Process for preparing fluoroanilines. 3,910,985, Cl. 260-471.00R.

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Narayanan, Venkatachala L.; and Haugwitz, Rudiger D., to E. R. Squibb & Sons, Inc. Anthelmintic 5-(heterocyclyl)-3-(isothiocyanophenyl)oxadiazoles. 3,910,940, Cl. 260-302.00H.

Narayanan, Venkatachala L.; Martinez, Anthony Joseph; and Haugwitz, Rudiger D., to E. R. Squibb & Sons, Inc. Anthelmintic (isothiocyanophenyl) oxadiazoles. 3,910,942, Cl. 260-307.00G.

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Nolin, Roger J., to Tool Research & Engineering Corporation. Panic proof lock set. 3,910,613, Cl. 292-34.000.

Nomura, Katsuaki: *See*—
Sone, Masao; Arai, Kojiro; and Nomura, Katsuaki, 3,910,026.

Nonnenmacher, Gerhard, to Robert Bosch G.m.b.H. Force compensating arrangement for a radial piston machine. 3,910,162, Cl. 91-498.000.

Nora International Company: *See*—
Welch, Cletus N., 3,910,828.

Nord, Eric T.; and Scarbrough, Don R., to Nordson Corporation. Electrostatic spray-coating with hot melt compositions. 3,911,161, Cl. 427-30.000.

Nordell, Randy J., to Time Commerical Financing Corporation. Hydraulic valve unit. 3,910,313, Cl. 137-625.230.

Nordson Corporation: *See*—
Nord, Eric T.; and Scarbrough, Don R., 3,911,161.

Noren, Oscar B.; Balog, Stephen; and Garland, Carl C., to Parke, Davis & Company. Apparatus for offset printing capsules. 3,910,183, Cl. 101-41.000.

Norteman, Samuel L., to Wheeling-Pittsburgh Steel Corporation. Electrical metallic tubing. 3,910,315, Cl. 138-145.000.

Northern Electric Company Limited: *See*—
Arndt, Horst; and Demircioglu, Sayman Fadil, 3,911,423.
Reed, Phillip John, 3,910,022.

Norton Company: *See*—
Coes, Loring, Jr., 3,909,991.
Torti, Maurice L., Jr.; and Richerson, David W., 3,911,188.

Nortron Corporation: *See*—
Curchod, Donald B.; and Madden, Allan C., 3,910,121.

Notarys, Harris A.; and Mercereau, James E., to California Institute of Technology. Multilayered thin film superconductive device, and method of making same. 3,911,333, Cl. 357-5.000.

Novak, Arthur F.: *See*—
Mod, Robert R.; Magne, Frank C.; Sumrell, Gene; Novak, Arthur F.; and Solar, James M., 3,910,948.
Mod, Robert R.; Harris, James A.; Arthur, Jett C., Jr.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 3,911,120.

Novak, James B. W., to Continental Can Company, Inc. Self concealing non detach easy open end device. 3,910,454, Cl. 220-269.000.

Novinson, Thomas: *See*—
O'Brien, Darrell E.; Senga, Keitaro; and Novinson, Thomas, 3,910,907.
Nowikas, Walter M., to Donley, Miller & Nowikas, Inc. Stored energy ejector mechanism. 3,910,125, Cl. 74-2.000.
Nunner, Hans-Herbert: *See*—
Wiest, Hubert; Stoll, Alois; and Nunner, Hans-Herbert, 3,911,053.
Nupro Company: *See*—
Boylan, John R., 3,910,553.
Nussim, Manasse; Levy, Ezra; and Naiman, Jacob, to Plantex, Ltd. Benzylcyano-amides. 3,910,984, Cl. 260-465.00D.
N.V. Industrieele Handelscombinatie Holland: *See*—
Van der Gaag, Cornelis, 3,910,609.
Nyffenegger, Willy: *See*—
Kolb, Alfred E.; and Nyffenegger, Willy, 3,911,482.
Nyman, Curt Lennart. Scaffold structure. 3,910,378, Cl. 182-103.000.
O.C. Mechanical Research and Engineering Company Pty. Ltd.: *See*—
O'Connor, James Alexander, deceased; Warne-Smith, Andrew David, administrator; Radcliffe, John Francis, administrator; and O'Connor, Kathleen Mary, administrator, 3,910,068.
Oakley, George J.: *See*—
Mecklenburg, Clifford G.; and Oakley, George J., 3,910,370.
Obayashi, Nobuharu, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument capable of transposition. 3,910,149, Cl. 84-1.010.
Obermeyer, Ernest J., Jr.; and Reed, Robert J., to Ford Motor Company. Carburetor accelerator pump control apparatus. 3,911,061, Cl. 261-34.00B.
O'Brien, Darrell E.; Senga, Keitaro; and Novinson, Thomas, to ICN Pharmaceuticals, Inc. Pyrazolo(1,5-a)-1,3,5-triazines. 3,910,907, Cl. 260-248.0NS.
O'Callaghan, Gerald F.; and Haurykiewicz, John M., to Eaton Corporation. Winder control. 3,910,521, Cl. 242-75.510.
Occhipinti, Carl: *See*—
Spaulding, Tedford H.; and Occhipinti, Carl, 3,910,670.
Occidental Petroleum Corporation: *See*—
Garrett, Donald E.; Kallerud, Mauritz J.; and Chemtob, Elie M., 3,910,773.
Ocean Investments (Gibraltar) Limited: *See*—
Tildesley, James Matthew George, 3,909,913.
O'Connor, James Alexander, deceased; by Warne-Smith, Andrew David, administrator; by Radcliffe, John Francis, administrator; and by O'Connor, Kathleen Mary, administrator, to O.C. Mechanical Research and Engineering Company Pty. Ltd. Joints between drive and driven shafts. 3,910,068, Cl. 64-13.000.
O'Connor, Kathleen Mary, administrator: *See*—
O'Connor, James Alexander, deceased; Warne-Smith, Andrew David, administrator; Radcliffe, John Francis, administrator; and O'Connor, Kathleen Mary, administrator, 3,910,068.
Oda, Gosen Kogyo Kabushiki Kaisha: *See*—
Takai, Isao, 3,910,025.
Odom, J. T.: *See*—
Zumsteg, D. Bruce; Odom, J. T.; and Walkington, William L., 3,910,429.
Oepke, Heinz Wilhelm: *See*—
Albrecht, Erhard; Oepke, Heinz Wilhelm; and Wulfmeier, Herbert, 3,910,208.
Albrecht, Erhard; Oepke, Heinz Wilhelm; and Wulfmeier, Herbert, 3,910,209.
Oestmann, Eldon Dale, to Caterpillar Tractor Company. Control linkage for hydrostatically powered drive and steering system or the like. 3,910,133, Cl. 74-479.000.
Offshore Company, The: *See*—
Jefferies, Robert Kennedy; Wickline, Glenn D., deceased; Wickline, Barbara Alice, executrix; and Mirdadian, Kian Mohammed, 3,910,110.
Ogura, Katsuyuki: *See*—
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Ohi, Reiichi: *See*—
Shiba, Keisuke; Hinata, Masanao; Ohi, Reiichi; and Shishido, Tadao, 3,910,795.
Ohio Nuclear, Inc.: *See*—
Stout, Karl J., 3,911,278.
Ohki, Seisaku: *See*—
Ohno, Genji; Uchiyama, Tadamitsu; Ohki, Seisaku; and Morohashi, Hishao, 3,911,448.
Ohlsson, Irwin G. Glow plug. 3,911,326, Cl. 317-98.000.
Ohmori, Sachio, to Nippon Kogaku K.K. Quick return mirror device in a single lens reflex camera. 3,911,454, Cl. 354-154.000.
Ohnaka, Makoto, to Shiroyama Kogyo Kabushiki Kaisha. Apparatus for supporting a manipulator arm. 3,910,535, Cl. 248-16.000.
Ohno, Eiji; Tanaka, Toshihiro; and Yamashita, Hisateru, to Kabushiki Kaisha Komatsu Seisakusho. Intermittent feed device. 3,910,127, Cl. 74-40.000.
Ohno, Genji; Uchiyama, Tadamitsu; Ohki, Seisaku; and Morohashi, Hishao, to Research & Development Laboratories of Ohno Company Limited. Plural liquid recording elements. 3,911,448, Cl. 346-140.000.
Ohrn, Karl Gustav Verner. Safety cut-off valve. 3,910,306, Cl. 137-498.000.
Ohta, Ichiro: *See*—
Nakamura, Hajime; and Ohta, Ichiro, 3,911,244.
Ohta, Takahisa: *See*—
Kobayashi, Shinzo; and Ohta, Takahisa, 3,911,396.
Ohta, Yoshinori; Saito, Fujio; and Sakaguchi, Mitsuhito, to Nippon Electric Company Limited. Light deflection stabilizing apparatus. 3,911,410, Cl. 340-173.0LM.
Ohtake, Toshikazu; Taniguchi, Koichi; and Tsuda, Tadashi, to Nippondenso Co., Ltd. Oscillation control circuit for vehicle warning system. 3,911,373, Cl. 331-65.000.
Ohtomo, Koichiro: *See*—
Kondo, Ko; Ito, Takashi; and Ohtomo, Koichiro, 3,910,799.
Oiwa, Katsuhiko: *See*—
Omori, Norio; and Oiwa, Katsuhiko, 3,910,240.
Oiye, George: *See*—
Lasky, Daniel J.; Puder, Allen T.; Wright, Philip Richard; and Oiye, George, 3,911,460.
Oji, Takashi; and Yamazaki, Takeshi. Recording head shifting mechanism of cylinder-scanning type image recording device. 3,911,210, Cl. 178-6.60R.
Ojima, Iwao: *See*—
Nagai, Yoichiro; Ojima, Iwao; and Inaba, Shinichi, 3,910,980.
Okada, Nobuhiko; and Suzuki, Teruaki, to Osaka Gas Kabushiki Kaisha; and Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho. Crusher. 3,910,507, Cl. 241-73.000.
Okada, Takeshi; and Mitsui, Kazuhiko, to Olympus Optical Co., Ltd. Electrosurgical instrument. 3,910,279, Cl. 128-303.150.
Okamasa, Makoto: *See*—
Sugimoto, Yukio; Okamasa, Makoto; and Fukumura, Toyoshi, 3,911,231.
Okamoto, Katashi, to Robert Bosch G.m.b.H. Fuel injection pump for internal combustion engines. 3,910,724, Cl. 417-206.000.
Okazaki, Yoshimi: *See*—
Ikekawa, Tetsuro; Shimada, Fumitake; Okazaki, Yoshimi; Tachibana, Koichi; and Aikawa, Norio, 3,910,938.
Oki Electric Industry Co., Ltd.: *See*—
Kishi, Hajimu; and Momo, Kazushige, 3,911,258.
Tabei, Hitoshi; and Kazama, Munetada, 3,911,383.
Oki, Masami: *See*—
Yuge, Haruki; Oki, Masami; and Miwa, Naoto, 3,910,042.
Okumura, Jun: *See*—
Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, 3,910,900.
Okuno, Yositosi, to Sumitomo Chemical Company, Limited. Fumigant composition containing a chrysanthemic acid ester. 3,911,101, Cl. 424-40.000.
Okuno, Youichi, to Canon Kabushiki Kaisha. Viewfinder for single lens reflex cameras including means to view exposure guides. 3,911,457, Cl. 354-225.000.
Okura, Rikuo, to Diesel Kiki Kabushiki Kaisha. Fuel compensating device for a supercharged type diesel engine. 3,910,245, Cl. 123-140.0MP.
Olin Corporation: *See*—
Kavan, Vladimir, 3,910,477.
Syrop, Allan H.; and Tejera, Pedro T., 3,910,879.
Olinkraft, Inc.: *See*—
Bamburg, Robert A.; and Hubenthal, Harry K., 3,910,482.
Olympus Optical Co., Ltd.: *See*—
Nitami, Takasi; and Ito, Yosikazu, 3,910,686.
Okada, Takeshi; and Mitsui, Kazuhiko, 3,910,279.
O'Melia, Frances, to Dow Chemical Company, The. Nematicidal methods using substituted pyridinyl phosphonamidate, phosphonamidothioste, phosphorodiamidate and phosphorodiamido-thioate. 3,911,118, Cl. 424-200.000.
Omori, Norio; and Oiwa, Katsuhiko, to Nippondenso Co., Ltd. Electronically controlled fuel injection system. 3,910,240, Cl. 123-32.0EA.
Omori, Norio: *See*—
Fujisawa, Hideya; and Omori, Norio, 3,910,241.
O'Neill, Joseph L., Jr., to GTE Information Systems Incorporated. Data storage and processing apparatus. 3,911,403, Cl. 340-172.500.
O'Neill, Joseph L., Jr., to GTE Information Systems Incorporated. Data storage and processing apparatus including processing of new line characters. 3,911,404, Cl. 340-172.500.
Onishi, Keizi: *See*—
Nakamura, Shigeo; Takano, Yutaka; Suzumura, Masaki; and Onishi, Keizi, 3,911,233.
Ono, Hiromu; and Kanefusa, Yoshikiyo, to Aoki Construction Company Limited. Connecting structure for ocean-going push-barge. 3,910,219, Cl. 114-235.00R.
Onopchenko, Anatoli; Schulz, Johann G. D.; and Seekircher, Richard, to Gulf Research & Development Company. Process for oxidizing a benzenoid structure carrying a methyl substituent. 3,910,996, Cl. 260-524.00R.
OPT Industries, Inc.: *See*—
Slack, William Frederick, 3,911,352.
Oram, John Anderson. Lamp support assembly. 3,911,266, Cl. 240-52.100.
Ord, Walter Desmond, to Redman Fisher Engineering Limited. Power and free conveyor system with positively controlled dog. 3,910,199, Cl. 104-172.00S.
Orentreich, Norman. Method of treating human skin. 3,910,284, Cl. 128-355.000.
Orion Research Incorporated: *See*—
Riseman, John H., 3,910,607.
Orsing, John Harry. Grill for broiling meat, fish, vegetables. 3,910,250, Cl. 126-9.00A.
Orsucci, Sergio: *See*—
Murari, Bruno; Cossuta, Giuseppe; and Orsucci, Sergio, 3,911,327.

Orthodyne Electronics: *See—*
Smith, Michael C.; and Smith, Hal W., Jr., 3,909,911.

Ortlieb, Alfred, to Robert Bosch G.m.b.H. Electrographic writing apparatus for a metallized strip recording medium using grounded electrodes between writing electrodes. 3,911,447, Cl. 346-74.0SB.

Osaka Gas Kabushiki Kaisha: *See—*
Okada, Nobuhiko; and Suzuki, Teruaki, 3,910,507.

Osborn, Robert A.; and Bullard, Herbert L., to Goodyear Tire & Rubber Company, The. Synthetic resin of styrene, isobutylene and 1,3-butadiene. 3,910,865, Cl. 260-80.700.

Osborne, Raymond John Walcot; Miles, Anthony Thomas; and Tilley, Nicholas, to Milk Marketing Board. Preparation of concentrated starter cultures. 3,911,140, Cl. 426-36.000.

O'Shaughnessy, Roger D., to Cardinal Insulated Glass Co. Heated multiple-pane glass units. 3,911,245, Cl. 219-218.000.

Oskar Dilo KG: *See—*
Dilo, Richard, 3,909,891.

Osprey Metals Limited: *See—*
Brooks, Reginald Gwyn, 3,909,921.

Oster, Lloyd Robert, to General Electric Company. Acceleration control system for electrically propelled traction vehicles. 3,911,343, Cl. 318-392.000.

Osthues, Robert H.: *See—*
Hills, James B.; and Osthues, Robert H., 3,910,552.

Ota, Takaaki: *See—*
Kozakai, Asao; Ishikawa, Masakazu; Ota, Takaaki; and Ito, Sadayoshi, 3,910,640.

Otsuka Pharmaceutical: *See—*
Tamura, Yasumitsu; Nakagawa, Kazuyuki; Yoshizaki, Shiro; and Murakami, Nanami, 3,910,924.

Otto, Noel A.; and Riefler, Roger G., to Automatic Switch Company. Condition responsive control device with capacity for independent adjustment of control points and transducer therefor. 3,911,238, Cl. 200-83.00S.

Ours, Carroll Wayne: *See—*
Jones, Peter Hadley; Kyncl, Jaroslav; Ours, Carroll Wayne; and Somani, Pitambar, 3,910,988.

Outokumpu Oy: *See—*
Rastas, Jussi, 3,910,784.

Owens, Carl D.: *See—*
Gardner, Delbert J.; Sisco, William C.; Grabb, Frederick G.; and Owens, Carl D., 3,910,046.

Owens-Corning Fiberglas Corporation: *See—*
Gelin, Robert J.; Stotler, David V.; and Daugherty, John W., 3,910,513.

Owens-Illinois, Inc.: *See—*
Deeren, Thomas J., 3,910,411.

Owens, Robert W.: *See—*
Pulver, W. O.; and Owens, Robert W., 3,910,406.

Oyjord, Egil. Seed drilling machines. 3,910,217, Cl. 111-77.000.

Ozaki, Tomoaki; Minagawa, Nobuhiko; and Kato, Kazunobu, to Fuji Photo Film Co., Ltd. Method of making a resin coated paper having a smooth surface. 3,911,180, Cl. 427-362.000.

Pace, Jerry B. Audio frequency amplitude compensator. 3,911,370, Cl. 330-21.000.

Packer, Mervyn Brian, to Automotive Products Co. Ltd. Anti-skid brake control systems. 3,910,644, Cl. 303-21.0BE.

Paetsch, Juergen: *See—*
Merkel, Karl; Datow, Joachim; Paetsch, Juergen; Hoffmann, Herwig; and Winderl, Siegfried, 3,910,983.

Pahl, Emanuel: *See—*
Luttgert, Hans; Brunk, Karl; Dietrich, Johannes; and Pahl, Emanuel, 3,910,094.

Pandrol Limited: *See—*
Wood, Thomas William, 3,910,493.

Pangborn, Jon B.: *See—*
Sharer, John E.; Pangborn, Jon B.; and Dufour, Raymond J., 3,910,255.

Panneton, Jean. Ceiling board jack. 3,910,421, Cl. 214-1.0SW.

Panzer, George W., to Alcolac, Inc. Aqueous soluble mixed complex salts of aluminum aliphatic alcohol sulfates. 3,910,978, Cl. 260-448.00R.

Papantoniou, Christos; and Boulogne, Jean, to Societe Anonyme dite: L'Oreal. Fatty compositions for use in cosmetic makeup compositions and said cosmetic makeup compositions. 3,911,105, Cl. 424-64.000.

Parke, Davis & Company: *See—*
Noren, Oscar B.; Balog, Stephen; and Garland, Carl C., 3,910,183.

Parker, Edward I. Damaged needle detection apparatus. 3,910,074, Cl. 66-157.000.

Parker, Russell H. R., to Superior Brush Company. Rotary brush assembly. 3,909,871, Cl. 15-182.000.

Parmele, Charles S.: *See—*
Moyer, John R.; and Parmele, Charles S., 3,910,999.

Parquet, Donald J.: *See—*
Pedersen, Carl O.; and Parquet, Donald J., 3,910,566.

Particle Technology, Inc.: *See—*
Corll, James A., 3,910,702.

Paschenko, Nikolai Konstantinovich: *See—*
Chemeris, Oleg Nikolaevich; Tretyakov, Evgeny Vasilievich; Didkovsky, Viktor Kirillovich; Kanfer, Vilen Davidovich; Paschenko, Nikolai Konstantinovich; Zeltser, Izmail Grigorievich; Ljukimson, Girgory Mikhailovich; Bashkatov, Alexandr Nikolaevich; Melnikov, Boris Nikolaevich; Medzhibozhsky, Miron Yakovlevich; Goldberg, Ilya Alexandrovich; Juzefovsky, Izrail Abramovich; Ratmansky, Rafail Davidovich; Irkha, Viktor Nikolaevich; Borisov, Jury Nikolaevich; and Kurochkin, Fedor Filippovich, 3,911,175.

Passalenti, Beppino: *See—*
Vargiu, Silvio; Passalenti, Beppino; and Nistri, Ugo, 3,911,048.

Passey, Arjun Dev. Apparatus for freeze-drying. 3,909,957, Cl. 34-92.000.

Pasternak, Edward: *See—*
Giannuzzi, Robert J.; Langdon, Glen G., Jr.; and Pasternak, Edward, 3,911,424.

Patel, Jean E., to Poclain, S.A. Back-acting shovel with cooperating shield. 3,909,963, Cl. 37-117.500.

Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH: *See—*
Kummel, Ulrich; and Mair, Manfred, 3,911,309.

Paton, Boris Evgenievich; Kudinov, Vladimir Mikhailovich; Bushtedt, Jury Petrovich; Petushkov, Vladimir Georgievich; Volgin, Leonid Alexandrovich; Pogoretsky, Georgy Ivanovich; and Sukhikh, Leonid Leonidovich. Apparatus for explosive working of metals. 3,910,084, Cl. 72-56.000.

Patriquin, George P., to Hudson Lock, Inc. Plunger lock with compensating spline. 3,910,082, Cl. 70-360.000.

Patsch, Manfred: *See—*
Schaffner, Ernst; Eilingsfeld, Heinz; and Patsch, Manfred, 3,911,033.

Patten, Michael Allen, to International Business Machines Corporation. Delta modulation circuitry with automatic squelch and gain control. 3,911,363, Cl. 325-38.00B.

Paulovich, John M.: *See—*
Cummings, Jerry D.; and Paulovich, John M., 3,910,495.

Pauza, William Vito; and Poltonavage, Edward Michael, to AMP Incorporated. Multi-contact electrical connector for a ceramic substrate or the like. 3,910,664, Cl. 339-17.0CF.

Pavlovsky, Rudolf; Mahnig, Fritz; and Tobler, Werner, to Georg Fischer Aktiengesellschaft. Apparatus for testing mechanically loaded wheel-shaped components. 3,910,109, Cl. 73-146.000.

Paxton, Jerre H.; and Holmes, Jack H., to Kwik Lok Corporation. Method and machine for removeably securing stiff plastic closures flat against series of moving packages. 3,910,811, Cl. 156-521.000.

Payne, George Calvin, to Willamette Cherry Growers, Inc. Fruit pit detecting method and apparatus. 3,910,416, Cl. 209-74.00M.

Pearce, Bryan Robert; and Daniels, Douglas William, to Rolls-Royce (1971) Limited. Shaft bearing assemblies. 3,910,651, Cl. 308-26.000.

Peautaurit, Pierre: *See—*
Evans, Anthony Charles; and Peautaurit, Pierre, 3,910,448.

Pecci, Carlos Romeu Y. Process and apparatus for crushing hard or abrasive materials under high pressure without contamination of the ground product. 3,910,506, Cl. 241-29.000.

Pedersen, Carl O.; and Parquet, Donald J., to J. I. Case Company. Coil spring detent assembly. 3,910,566, Cl. 267-167.000.

Peisach, Joel M., to Polaroid Corporation. Radiographic diffusion transfer element. 3,910,793, Cl. 96-76.00R.

Pejchar, Jan: *See—*
Polanyi, Thomas G.; Pejchar, Jan; and Wallace, Robert A., 3,910,276.

Pelletier, Guy, to Bombardier Limited. Tire buffing apparatus and method. 3,910,337, Cl. 157-13.000.

Pender, David R. Locking means for bicycles and the like. 3,910,081, Cl. 70-234.000.

Penetred Corporation: *See—*
Felker, Paul J., 3,910,332.

Penney, Gaylord W. Electrostatic dust filter. 3,910,779, Cl. 55-124.000.

Pennwalt Corporation: *See—*
LaLande, William Alfred, Jr.; Hauptschein, Murray; and Hager, Robert Bonner, 3,911,035.

Pentchev, Peter G.; and Brady, Roscoe O., to United States of America, Health, Education, and Welfare. Isolation of glucocerebrosidase from human placental tissue. 3,910,822, Cl. 195-62.000.

Perez, Charles G. Flower stem wrapper. 3,909,979, Cl. 47-55.000.

Perkin-Elmer Limited: *See—*
Leane, John Bryant; and Higham, Peter, 3,911,355.

Perlman, Marvin: *See—*
United States of America, National Aeronautics and Space Administration; and Perlman, Marvin, 3,911,330.

Perron, Peter J.: *See—*
Castagna, Eugene G.; Perron, Peter J.; and Christensen, Ronald I., 3,911,052.

Perrot, Robert Claude, to Societe des Acieries de Paris CT d'Outreau. Great-length frogs for very high speed traffic railway tracks. 3,910,534, Cl. 246-468.000.

Perry, Dale C.: *See—*
Shelton, James Reid; and Perry, Dale C., 3,911,040.

Persicke, Gunter; and Child, James Richard, to Road Research Limited. Shock absorbers. 3,910,565, Cl. 267-116.000.

Persson, Walther; and Schibbye, Lauritz Benedictus, to Svenska Rotor Maskiner Aktiebolag. Screw rotor machine with multiple working spaces interconnected via communication channel in common end plate. 3,910,731, Cl. 418-9.000.

Peter, Diethard, to U.S. Philips Corporation. High-voltage vacuum tube, notably an X-ray tube, comprising a metal sleeve. 3,911,306, Cl. 313-58.000.

Peter Eckrich & Sons, Inc.: *See—*
Weatherspoon, J. B., 3,911,154.

Peters, Robert W. Cell inserting machine. 3,909,902, Cl. 29-205.00E.

Petersen, Howard L.: *See—*
United States of America, National Aeronautics and Space Admin-

istration; Cleveland, Garry J.; Loh, George M.; Luce, Robert S.; Belasco, Norman; Lipanovich, Marko I.; Petersen, Howard L.; Pool, Sam L.; and Mangold, Donald W., 3,910,257.

Peterson, Warren J., to Joerns Furniture Company. Reversible overbed table and mirror. 3,910,659, Cl. 312-226.000.

Peterson, William Donald, II. Coal to reactor feeder for coal liquidification. 3,910,428, Cl. 214-17.0CC.

Petrick, Paul; Schwedler, Hans-Peter; and Holzer, Alfred, to Ernst Roederstein Spezialfabrik. Cockcroft-walton cascade circuit for voltage multiplication. 3,911,292, Cl. 307-235.000.

Petrolite Corporation: *See*—
Mayse, Weldon D., 3,910,830.

Petushkov, Vladimir Georgievich: *See*—
Paton, Boris Evgenievich; Kudinov, Vladimir Mikhailovich; Bushtedt, Jury Petrovich; Petushkov, Vladimir Georgievich; Volgin, Leonid Alexandrovich; Pogoretsky, Georgy Ivanovich; and Sukhikh, Leonid Leonidovich, 3,910,084.

Pezier, Yves: *See*—
Fourrey, Francois; Pezier, Yves; and Droual, Rene, 3,910,543.

Pfaffenberger, Eugene E.: *See*—
Price, Connor E.; Pfaffenberger, Eugene E.; and Derner, William J., 3,910,656.

Pfiffner, Albert: *See*—
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,910,893.
Chodnekar, Madhukar Subraya; Loeliger, Peter; Pfiffner, Albert; Schwieter, Ulrich; Suchy, Milos; and Zurflueh, Rene, 3,910,897.
Chonekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,910,892.

Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., to Syntex (U.S.A.) Inc. Xanthone carboxylic acids and derivatives. 3,910,957, Cl. 260-335.000.

Pfizer Inc.: *See*—
Babineau, Joseph G., 3,910,013.
Cross, Peter E.; Stichbury, James R.; Thorpe, Eric F.; and Scollick, Neil M., 3,910,896.
Edinberry, Michael N.; and McLay, Grant W., 3,911,008.

Philip Morris Incorporated: *See*—
Iten, Clemens A., 3,909,940.

Phillips, Alan C. Accelerator holding device. 3,910,135, Cl. 74-532.000.

Phillips, David C.: *See*—
Szedon, John R.; Jackson, John A.; and Phillips, David C., 3,911,475.

Phillips, Lawrence, Jr., to Unicorn Industries. Fitting for connecting electrical conduit to a junction box. 3,910,608, Cl. 285-3.000.

Phillips, Leopold Samuel. Bonding apparatus. 3,909,915, Cl. 228-160.000.

Phillips Petroleum Company: *See*—
Bowman, Edward L., 3,910,863.
Carter, Cecil O., 3,911,044.
Chapman, Charles C., 3,910,771.
Coburn, Leslie O.; and Farfaglia, Silvio T., 3,910,169.
Gagle, Duane W.; and Draper, Homer L., 3,910,710.
Mastroianni, Martin J., 3,910,350.
Moczygemba, George A.; and Hsieh, Henry L., 3,910,868.

Phillips, Ronald L., to General Motors Corporation. Variable diameter split-flange pulley. 3,910,129, Cl. 74-230.17B.

Phillips, Warren G., to Avco Corporation. High compressive strength adhesive. 3,910,857, Cl. 260-38.000.

Phoenix, Lancelot; Walker, John William Euclid; and Mather, Alan George, to Lucas Electrical Company Limited. Harvesting machines. 3,910,286, Cl. 130-27.00H.

Picard, Karl-Heinz; Busch, Wolfgang; and Plage, Jurgen, to Siemens Aktiengesellschaft. Contact assembly for a metal-clad, gas-insulated high-voltage line. 3,911,198, Cl. 174-28.000.

Piguet, Albert, to Aqustar S.A. Timer. 3,910,362, Cl. 58-74.000.

Pijpers, Emanuel M. J.: *See*—
Roest, Bernard C.; and Pijpers, Emanuel M. J., 3,911,054.

Piljus, Vladimir Grigorievich: *See*—
Lebedev, Viktor Fedorovich; Zaitsev, Anatoly Petrovich; Kvin, Pavel Fishelevich; Shuboderov, Viktor Mikhailovich; Piljus, Vladimir Grigorievich; Filimonova, Nina Nikodimovna; and Suslakova, Svetlana Ivanovna, 3,909,917.

Pilot Research Corporation: *See*—
Garrou, Philip H.; and Schubert, William D., 3,909,851.

Pinkham, Newell W. Material handling apparatus. 3,910,297, Cl. 134-76.000.

Pioneer Electronic Corporation: *See*—
Maruyama, Yoshio; and Fushimi, Akihiro, 3,911,495.

Pisanchyn, John: *See*—
Baker, Josefina T.; Fuhrmann, Robert; Koff, Fred W.; and Pisanchyn, John, 3,910,891.

Pisarski, Lech; Valiensi, Adelbert W.; Baessler, Lee R.; and Glassner, Harvey F., to Humetrics Corporation. Cerebral activity monitor. 3,910,258, Cl. 128-2.10B.

Pitney-Bowes, Inc.: *See*—
Brown, Michael A.; and Chiapetta, Frank R., 3,910,568.

Pitre, Davide: *See*—
Felder, Ernst; and Pitre, Davide, 3,910,989.

Pitts, Charles A., to Dow Chemical Company, The. Drillable bridge plug. 3,910,348, Cl. 166-134.000.

Placzek, Peter: *See*—
Harding, John; and Placzek, Peter, 3,910,323.

Plage, Jurgen: *See*—
Picard, Karl-Heinz; Busch, Wolfgang; and Plage, Jurgen, 3,911,198.

Plantex, Ltd.: *See*—
Nussim, Manasse; Levy, Ezra; and Naiman, Jacob, 3,910,984.

Plapper, Jurgen: *See*—
Dieckelmann, Gerhard; Hartmann, Helmut; and Plapper, Jurgen, 3,910,972.

Plasko, Emil Robert, to Micro Devices Corporation. Means and method for protecting an overheating communication unit. 3,911,325, Cl. 317-40.00R.

Pleier, Walter J., to Eaton Corporation. Control for applying brake during transmission shifts. 3,910,389, Cl. 192-4.00C.

Plempel, Manfred: *See*—
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Draber, Wilfried; Plempel, Manfred; and Buchel, Karl Heinz, 3,910,936.

Pleshko, Peter: *See*—
Alt, Paul Matthew; Pleshko, Peter; and Schlig, Eugene Stewart, 3,911,421.

Ploussios, George, to Raytheon Company. Aircraft instrument landing system. 3,911,437, Cl. 343-108.00M.

Plumpe, Heimo: *See*—
Voth, Volkmar H.; and Plumpe, Heimo, 3,909,947.

Plunkett, Allan Barr, to General Electric Company. Method and apparatus for automatic IR compensation. 3,911,340, Cl. 318-230.000.

PMD Entwicklungswerk fur Kunststoffmaschinen GmbH & Co. KG: *See*—
Naumann, Wilhelm, 3,911,071.

Pneumatic Scale Corporation: *See*—
Sterling, Walter S., 3,910,407.

Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See*—
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Poclain, S.A.: *See*—
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Podnos, Selim S.: *See*—
Shelley, Edwin F.; Wenig, Harold G.; Podnos, Selim S.; and Shayne, Alexander, 3,910,193.

Pogoretsky, Georgy Ivanovich: *See*—
Paton, Boris Evgenievich; Kudinov, Vladimir Mikhailovich; Bushtedt, Jury Petrovich; Petushkov, Vladimir Georgievich; Volgin, Leonid Alexandrovich; Pogoretsky, Georgy Ivanovich; and Sukhikh, Leonid Leonidovich, 3,910,084.

Polanyi, Thomas G.; Pejchar, Jan; and Wallace, Robert A., to American Optical Corporation. Micro-surgical laser system. 3,910,276, Cl. 128-303.100.

Polaroid Corporation: *See*—
Peisach, Joel M., 3,910,793.
Scibilia, Peter A., 3,910,692.
Wilson, Stewart W.; and Ericson, John W., 3,911,494.

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Polovnikov, Valery Alexandrovich: *See*—
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Poltonavage, Edward Michael: *See*—
Pauza, William Vito; and Poltonavage, Edward Michael, 3,910,664.

Polysius AG: *See*—
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Weber, Paul; Mollenkopf, Hans; Henning, Kurt; Heinemann, Otto; Schmits, Heinz-Herbert; Rother, Wolfgang; Ritzmann, Horst; Wurr, Jurgen; Krutzner, Karl, Jr.; Schossler, Werner; Goldmann, Wolf; and Schepers, Georg, 3,910,754.

Pommer, Ernst-Heinrich; Reuther, Wolfgang; Goettsche, Reimer; and Poppen, Heinrich, to BASF Aktiengesellschaft. Fungicidal wood protectant compositions. 3,911,134, Cl. 424-274.000.

Pomogailc, Anatoly Dmitrievich: *See*—
Belov, Gennady Petrovich; Dzhabiev, Taimuraz Savelievich; Dyachkovsky, Fridrikh Stepanovich; Smirnov, Vyacheslav Ivanovich; Karpova, Nelli Dzhavkharovna; Brikenshtein, Khaim-Mordkhe Aronovich; Gerasina, Matrena Petrovna; Kuzmin, Vladimir Evgenievich; Matkovsky, Petr Evgenievich; Russiyan, Ljudmila Nikolaevna; Pomogailc, Anatoly Dmitrievich; Chirkov, Nikolai Mikhailovich, deceased; and Chirkov, Mikhail Nikolaevich, administrator, 3,911,042.

Pontoppidan, Eskild. Double folding partition. 3,910,338, Cl. 160-199.000.

Pool, Sam L.: *See*—
United States of America, National Aeronautics and Space Administration; Cleveland, Garry J.; Loh, George M.; Luce, Robert S.;

Belasco, Norman; Lipanovich, Marko I.; Petersen, Howard L.; Pool, Sam L.; and Mangold, Donald W., 3,910,257.

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Popov, Alexei Ivanovich; Vinjukov, Jury Georgievich; Matjurin-Veretennikov, Leonid Iosifovich; Kashket, Vladimir Ovseevich; and Stepanov, Vladimir Mikhailovich. Device for placing cores into removable-flask moulds. 3,910,343, Cl. 164-340.000.

Poppen, Heinrich: *See—*
Pommer, Ernst-Heinrich; Reuther, Wolfgang; Goettsche, Reimer; and Poppen, Heinrich, 3,911,134.

Porta Systems Corporation: *See—*
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Portable Pool Covers, Inc.: *See—*
Martinez, Rudolph J., 3,910,519.

Porter, Philip: *See—*
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Portius, Hans Joachim: *See—*
Scheller, Frieder; Megges, Rudolf; Dittrich, Frank; Repke, Kurt; Portius, Hans Joachim; Kammann, Gunter; Schmidt, Hans-Jorg; and Haustein, Knut-Olaf, 3,910,881.

Possati, Mario, to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C. Inside gauge of the type having moving arms and direct contact feelers used to check the sizes of mechanical workpieces during their machining on machine tools. 3,909,950, Cl. 33-143.00R.

Potel, Jurgen: *See—*
Arnold, Herbert; Bourseaux, Friedrich; Potel, Jurgen; and Brock, Norbert, 3,910,982.

Potts, Vinson S.: *See—*
Kneusel, Raymond H. P.; and Potts, Vinson S., 3,910,453.

Poulsen, Arden Ellis, to Allied Chemical Corporation. Laminated buckle housing. 3,911,236, Cl. 200-61.58B.

Poziomek, Edward J.; Crabtree, Eleanor V.; and Kramer, David N., to United States of America, Army. Method of detecting organophosphorus agents using 1-phenyl-1,2,3-butanetrione-2-oxime and cyanide indicating composition. 3,910,763, Cl. 23-232.00R.

PPG Industries, Inc.: *See—*
Lavanish, Jerome M., 3,911,029.
Raetzsch, Carl W.; Van Hoozer, John F.; and Cunningham, Hugh, 3,910,827.

Prameta Prazisionsmettall-und Kunststofferzeugnisse G. Baumann & Company: *See—*
Grunert, Hellmuth; Vitt, Theodor; and Gortz, Johannes, 3,909,879.

Prasil, Vladimir, to Elitex. Device for controlling the operation of a winding unit in automatic winding machines. 3,910,515, Cl. 242-35.60R.

Prast, Gijsbert, to U.S. Philips Corporation. Cooling system. 3,910,063, Cl. 62-514.000.

Premisura AG Instrumente fur Prazisions-Messung: *See—*
Meier, Johann, 3,909,951.

Prestwood, Franklin H.: *See—*
Mardon, Austin; and Prestwood, Franklin H., 3,911,435.

Price, Connor E.; Pfaffenberger, Eugene E.; and Derner, William J., to FMC Corporation. Spherical roller bearing for heavy loads. 3,910,656, Cl. 308-194.000.

Price, George M., to Frymaster Corporation, The. Frying apparatus with compensated thermostat. 3,911,250, Cl. 219-442.000.

Price, Herbert P., to Celanese Coatings & Specialties Company. Triglycidyl isocyanurate preparation. 3,910,908, Cl. 260-248.0NS.

Prichard, William W.; and Stacey, Francis Wilfred, to Du Pont de Nemours, E. I., and Company. Bis(cyanophenyl)-3-formazancarbonitrile compounds. 3,910,877, Cl. 260-193.000.

Priem, Jan Jozef: *See—*
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Priese, Werner K.: *See—*
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Primary Childrens' Hospital: *See—*
Clark, Justin S.; and Veasy, Lloyd George, 3,910,256.

Pringle, Cliff H., to MacKichan, Hugh Gerald. Articulating paint brush. 3,909,866, Cl. 15-22.00R.

Pringle Electrical Manufacturing Company: *See—*
Henderson, Louis S.; and Lachman, Gustav E., 3,911,240.

Prismo Universal Limited: *See—*
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Probert, Thomas I.; Richards, Kenneth J.; Wright, Craig N.; and Entrop, Gerard E., to Kennecott Copper Corporation. Process for purifying molybdenite concentrates. 3,911,076, Cl. 423-53.000.

Procter & Gamble Company, The: *See—*
Bates, Norman Andrew; and Tarr, Robert Earl, 3,911,157.

Professional Staff Association of the Los Angeles County Harbor General Hospital: *See—*
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Protiva, Miroslav; Vejdelek, Zdenek; Metys, Jan; and Hradil, Frantisek, to SPOFA United Pharmaceutical Works. 1-(4-Methanesulfonyl phenacyl)-4-phenyl piperazine. 3,940,916, Cl. 260-268.0PH.

Pshaenich, Alvin: *See—*
Mouton, Alcee Gonzague; and Pshaenich, Alvin, 3,911,426.

Ptacek, Jaroslav: *See—*
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Puder, Allen T.: *See—*
Lasky, Daniel J.; Puder, Allen T.; Wright, Philip Richard; and Oiye, George, 3,911,460.

Pulver, W. O.; and Owens, Robert W., to Velten & Pulver, Inc. Two-part clip. 3,910,406, Cl. 198-189.000.

Pundsack, Arnold L.; and Harris, Jerome N., to Xerox Corporation. System for electrically grounding or biasing a member. 3,910,475, Cl. 226-6.000.

Purdue Research Foundation: *See—*
Hem, Stanley L.; and White, Joe L., 3,911,090.

Putman, Thomas H., to Westinghouse Electric Corporation. Electrical measuring instrument having stationary coil-moving iron mechanism which operates on attraction principle. 3,911,356, Cl. 324-147.000.

Putnam, Peter Marten Herbert, to Hawker Siddeley Aviation Limited. Auxillary engine placement for STOL aircraft. 3,910,529, Cl. 244-12.00B.

Puzo, Gary A.: *See—*
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Quadbeck-Seeger, Hans-Juergen: *See—*
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Qu'Hen, Rene: *See—*
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Quimco GmbH: *See—*
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R F L Industries, Inc.: *See—*
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R. L. Kuss & Co.: *See—*
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Rabel, Imre: *See—*
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Rabinowitz, Joseph: *See—*
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Raby, Raymond; and Desrochers, Clement J., to Soquem. Pyrochlore flotation. 3,910,836, Cl. 209-166.000.

Rachlitz, Knud Viggo: *See—*
Holt, Niels Christian; Bos, Cornelis; and Rachlitz, Knud Viggo, 3,910,820.

Radcliffe, John Francis, administrator: *See—*
O'Connor, James Alexander, deceased; Warne-Smith, Andrew David, administrator; Radcliffe, John Francis, administrator; and O'Connor, Kathleen Mary, administrator, 3,910,068.

Radici, Pierino: *See—*
Ackermann, Jacob; Radici, Pierino; and Erini, Pietro, 3,911,046.

Raetzsch, Carl W.; Van Hoozer, John F.; and Cunningham, Hugh, to PPG Industries, Inc. Diaphragm cell. 3,910,827, Cl. 204-98.000.

Rafferty, Edson H.: *See—*
Kletschka, Harold D.; and Rafferty, Edson H., 3,910,281.

RAFI Raimund Finsterholzl Elektrotechnische Spezialfabrik: *See—*
Wasmeier, Albert, 3,910,668.

Ragsdale, Charles W.; and Weigl, James, to Bourns, Inc. End-tidal gas analysis apparatus for respirators. 3,910,261, Cl. 128-2.070.

Raisanen, Kalervo: *See—*
Tuomarla, Juhani; Raisanen, Kalervo; and Arvinen, Aulis, 3,910,839.

Raley, Garland E., to Ethyl Corporation. Embossed plastic film. 3,911,187, Cl. 428-180.000.

Ralston, Harold A., to J. I. Case Company. Hydraulic plow steering. 3,910,353, Cl. 172-1.000.

Ralston Purina Company: *See—*
Heusdens, Wilhelmus, 3,911,159.

Randall, Robert H., to Kaynar Mfg. Co., Inc. Nut. 3,910,331, Cl. 151-41.720.

Rank Organisation Limited, The: *See—*
Brown, Brian Edward, 3,911,319.
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Rastas, Jussi, to Outokumpu Oy. Process for the preparation of a raw material suitable for iron production. 3,910,784, Cl. 75-1.000.

Rath, Peter: *See—*
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Ratmansky, Rafail Davidovich: *See—*
Chemeris, Oleg Nikolaevich; Tretyakov, Evgeny Vasilievich; Didkovsky, Viktor Kirillovich; Kanfer, Vilen Davidovich; Paschenko, Nikolai Konstantinovich; Zeltser, Izmail Grigorievich; Ljukimson, Girgory Mikhailovich; Bashkatov, Alexandr Nikolaevich; Melnikov, Boris Nikolaevich; Medzhibozhsky, Miron Yakovlevich; Goldberg, Ilya Alexandrovich; Juzefovsky, Izrail Abramovich; Ratmansky, Rafail Davidovich; Irkha, Viktor Nikolaevich; Borisov, Jury Nikolaevich; and Kurochkin, Fedor Filippovich, 3,911,175.

Rau, Hans: *See—*
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Rauenbusch, Erich: *See—*
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Rauma-Repola Oy.: *See—*
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Ray, David L.: *See—*
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Ray, Jimmy C. Plastic film insert. 3,909,936, Cl. 29-629.000.

Raymond Lee Organization, Inc., The: *See—*
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Fojtik, Frank; and Dobis, Ivan, 3,910,676.
Harris, Betty R., 3,909,859.
Johnson, Dennis A.; and Johnson, Samuel C., 3,910,330.
Kiesling, Casper, 3,909,912.
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Raytheon Company: *See—*
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Razumovsky, Stanislav Dmitrievich; Zaikov, Gennady Efremovich; Mushenko, Dmitry Vasilievich; Klimenko, Vladimir Leonidovich; Tsyskovsky, Viktor Karlovich; and Juriev, Jury Nikolaevich. Method for preparing dicarboxylic acids. 3,911,000, Cl. 260-533.00C.

RCA Corporation: *See—*
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Curtis, Bernard John; and Brunner, Hans Rudolf, 3,911,176.
Flory, Robert Earl, 3,911,453.
Goodheart, Paul; and Sheng, Abel Ching Nam, 3,911,377.
Keizer, Eugene Orville, 3,911,476.
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Redfern, Sutton: *See—*
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Redman, Charles M., to United States of America, Army. Infrared microwave transponder. 3,911,433, Cl. 343-6.0ND.

Redman Fisher Engineering Limited: *See—*
Ord, Walter Desmond, 3,910,199.

Reece, Vernon E. Hand breader. 3,910,227, Cl. 118-29.000.

Reed, Dale C. Dental floss holder. 3,910,294, Cl. 132-91.000.

Reed, Phillip John, to Northern Electric Company Limited. Apparatus for stranding wires. 3,910,022, Cl. 57-34.0AT.

Reed, Robert D.; and McGill, Eugene C., to John Zink Company. Nitrogen oxide control using steam-hydrocarbon injection. 3,911,083, Cl. 423-235.000.

Reed, Robert J.: *See—*
Obermeyer, Ernest J., Jr.; and Reed, Robert J., 3,911,061.

Rees, Herbert, to Husky Injection Molding Systems. Ejection-control system for injection-molding machine. 3,910,740, Cl. 425-242.00R.

Reese, Stanley, to Dome Chemical Corporation. Closure for liquid container. 3,910,463, Cl. 222-153.000.

Reeves, Wilson A.: *See—*
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Regan, David, to Wilkinson Sword Limited. Method and apparatus for determining visual acuity in a human subject. 3,910,690, Cl. 351-31.000.

Regie Nationale des Usines Renault: *See—*
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Reichrath, Werner: *See—*
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Reid, Richard: *See—*
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Reifenhauser, Hans, to Reifenhauser KG. Double-worm extruder housing. 3,910,316, Cl. 138-171.000.

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Reilly, John J.: *See—*
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Reiman, Reuben H. Children's corrective foot splint. 3,910,267, Cl. 128-80.00A.

Reimann, Hans: *See—*
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Reinhall, Rolf Bertil. Method of producing fiber pulp from vegetable of fibrous material. 3,910,505, Cl. 241-18.000.

Reinhardt, George; Djordjevic, Mihailo; and Breen, Joseph, to Continental Can Company, Inc. Polygonal shaped container body forming apparatus. 3,910,171, Cl. 93-82.000.

Reinhardt, Robert M.; Cashen, Norton A.; and Reeves, Wilson A., to United States of America, Agriculture. Aluminum chlorhydroxide catalyst systems for treatments to give wrinkle resistant textiles. 3,909,861, Cl. 8-184.000.

Reinhold, Herbert E., Jr.: *See—*
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Relis, Matthew J.: *See—*
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Rembaum, Alan; Ingram, Marylou; Stroud-Schmink, F. Agnes; and Rounds, Donald E., to California Institute of Technology. Treatment of surfaces to stimulate biological cell adhesion and growth. 3,910,819, Cl. 195-1.700.

Renner Company, The: *See—*
James, W. Thomas, 3,910,437.

Rennick, John L., to Zenith Radio Corporation. Stop frame for optical playback system. 3,911,211, Cl. 178-6.60R.

Repke, Kurt: *See—*
Scheller, Frieder; Megges, Rudolf; Dittrich, Frank; Repke, Kurt; Portius, Hans Joachim; Kammann, Gunter; Schmidt, Hans-Jorg; and Haustein, Knut-Olaf, 3,910,881.

Republic Steel Corporation: *See—*
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Research Corporation: *See—*
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Research & Development Laboratories of Ohno Company Limited: *See—*
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Resz, Raoul; Bartl, Herbert; and Hohmann, Gerhard, to Bayer Aktiengesellschaft. Coated granulates of ethylene/vinyl acetate copolymers. 3,911,193, Cl. 428-407.000.

Rettig, Charles E., to Litton Industrial Products, Inc. Method for controlling the output condition of a synchronous reluctance motor. 3,911,339, Cl. 318-171.000.

Reuss, Helmut: *See—*
von Konig, Anita; Reuss, Helmut; and Muller, Anneliese, 3,910,791.

Reuther, Wolfgang: *See—*
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Rex Chainbelt Inc.: *See—*
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Rexham Corporation: *See—*
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Rexnord Inc.: *See—*
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Albrecht, Erhard; Oepke, Heinz Wilhelm; and Wulfmeier, Herbert, 3,910,209.

Rhodes, Charles W., to Tektronix Inc. Method and apparatus for processing test signals which convey information as to gain and delay distortions of T.V. systems. 3,911,478, Cl. 358-10.000.

Rhone-Poulenc S.A.: *See—*
Bargain, Michel, 3,910,859.
Lesaicherre, Andre; and Linguenheld, Louis, 3,911,169.
Michelet, Daniel, 3,910,967.

Rhone-Progil: *See—*
Gielly, Jean-Francois, 3,911,079.

Ribka, Joachim: *See—*
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Ricart, Emilio Llovet. Circular knitting machine frame. 3,910,069, Cl. 66-8.000.

Rice, Norman Douglas: *See—*
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Rich, Edward L. Article transfer and support apparatus. 3,910,420, Cl. 214-1.0BB.

Richard, Gilbert Gerard, to Cheminees Richard le Droff S.A. Open hearth-room-heating devices working on closed circuit. 3,910,252, Cl. 126-120.000.

Richards, Basil James, to New Century Novelty Company Pty. Limited. Replaceable plug-in reel module for game machines. 3,910,582, Cl. 273-143.00R.

Richards, Elmer A., to Eaton Corporation. Transmission with snap shift. 3,910,131, Cl. 74-331.000.

Richards, Kenneth J.: *See—*
Probert, Thomas I.; Richards, Kenneth J.; Wright, Craig N.; and Entrop, Gerard E., 3,911,076.

Richardson Company, The: *See—*
Schouten, James J.; and Wargin, Robert V., 3,911,051.

Richarme, Victor Louis Paul, to Essilor International. Compensating device for sighting instruments. 3,910,704, Cl. 356-249.000.

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Richerson, David W.: *See—*
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Richter Gedeon Vegyeszeti Gyar RT.: *See—*
Szantay, Csaba; Szabo, Lajos; and Kalaus, Gyorgy, 3,910,953.

Ricoh Co., Ltd.: *See—*
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Riefler, Roger G.: *See—*
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Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Self adjusting trunnion bearing seal arrangement. 3,910,653, Cl. 308-36.100.

Riegler, Ernst: *See—*
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Rieper, Wolfgang; and Ribka, Joachim, to Hoechst Aktiengesellschaft. Disazo compounds containing 3-amido-pyrazole-5-one components. 3,910,875, Cl. 260-161.000.

Ries, Russell J. Tensioning device. 3,910,108, Cl. 73-143.000.

Riesenberg, Klaus-Otto, to Robert Bosch G.m.b.H. Apparatus for the prevention of wheel locking in motor vehicles. 3,910,648, Cl. 303-21.00F.

Riester, William C.; and Graczyk, Bronislaus S., to Trico Products Corporation. Self-dimensioning bearing assembly. 3,910,652, Cl. 308-26.000.

Rigassi, Norbert: *See—*
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Riley, Arthur F., to Teletype Corporation. Dual pulse train generating apparatus utilizing only one magnetic sensor. 3,911,301, Cl. 310-111.000.
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Riniker, Bernhard; and Rittel, Werner, to Ciba-Geigy Corporation. Hypocalcaemically active peptides related to human calcitonin. 3,910,872, Cl. 260-112.500.
Ripperger, Willi: *See—*
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Riseman, John H., to Orion Research Incorporated. Apparatus for determining the concentration of species. 3,910,607, Cl. 283-1.00A.
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Ritsko, Joseph E.: *See—*
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Rittel, Werner: *See—*
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Ritter, Dale Louis, to International Paper Company. Two-piece, paperboard container construction. 3,910,483, Cl. 229-23.0BT.
Ritzmann, Horst: *See—*
Weber, Paul; Mollenkopf, Hans; Henning, Kurt; Heinemann, Otto; Schmits, Heinz-Herbert; Rother, Wolfgang; Ritzmann, Horst; Wurr, Jurgen; Krutzner, Karl, Jr.; Schossler, Werner; Goldmann, Wolf; and Schepers, Georg, 3,910,754.
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Road Research Limited: *See—*
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Robert, Andre, to Upjohn Company, The. Method of reducing the undesirable gastrointestinal effects of prostaglandin synthetase inhibitors. 3,911,124, Cl. 424-234.000.
Robert Bosch G.m.b.H.: *See—*
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Roberts, Gary A.; and Fitch, Ernest C., Jr., to Board of Regents for the Oklahoma Agricultural and Mechanical Colleges Acting on Behalf of Oklahoma State University of Agriculture and Applied Science. Statistical analog monitor. 3,911,362, Cl. 324-182.000.
Roberts, Lyman Richard, to Shell Oil Company. Terpene phenol resin compositions containing organophosphorus insecticides. 3,911,121, Cl. 424-219.000.
Robertshaw Controls Company: *See—*
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Robinson, Henry L., to Raymond Lee Organization, Inc., The. Toy car. 3,910,598, Cl. 280-226.00R.
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Roe, Anthony Maitland; Slater, Robert Antony; and Loev, Bernard, to Smith Kline & French Laboratories Limited. Certain bis-(hydroxyalkyl)esters of 1,4-dihydro-2,6-diloweralkyl-4-(2-trifluoromethylphenyl)pyridine-3, 5 dicarboxylic acid and the N-methyl derivative thereof. 3,910,937, Cl. 260-295.5OR.
Roean Industries: *See—*
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Roest, Bernard C.; and Pijpers, Emanuel M. J., to Stamicarbon N.V. Process for lowering the viscosity of a solution of a living polymer. 3,911,054, Cl. 260-880.00B.
Rohner, Benedikt, to Robert Krause KG. Securing device for loose-leaf binders. 3,910,708, Cl. 402-80.00R.
Rohr Industries, Inc.: *See—*
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Rohrmann, Charles A.: *See—*
Maness, Roy F.; Moore, Raymond H.; and Rohrmann, Charles A., 3,911,081.
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Ronden, Clifford P.; and Rabel, Imre, to Grandview Industries, Limited. Apparatus for belling plastic pipe. 3,910,744, Cl. 425-384.000.
Ronsse, August J., Jr., to Itek Corporation. Stereo viewer accumulator. 3,911,263, Cl. 240-2.0AT.
Roos, Cornelis J.; and Gilles, Peter, to Baird Atomic (Europe) B.V. Devices for moving sample holders to a measuring position and for effecting radioactive or other measurements of samples in the holders. 3,911,274, Cl. 250-328.000.
Roos, Dirk Godfried Johannes, to Windmoller & Holscher. Machine for continually working a web, particularly by welding and severing. 3,910,810, Cl. 156-510.000.
Roos, Ernst: *See—*
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Rosaen, Nils O., to Rosean, Nancy Helen, a part interest. Dual vane flow meter. 3,910,114, Cl. 73-228.000.
Rose, Ewald. Medical apparatus for measuring blood sedimentation. 3,910,103, Cl. 73-61.400.
Rose, Ivan L. Oil filter tool. 3,910,140, Cl. 81-90.00B.
Rose, Robert Charles, to Anglo-American Clays Corporation. Method of coating flexible sheet material. 3,911,174, Cl. 427-211.000.
Rosean, Nancy Helen: *See—*
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Ross, John M.; and Smith, Ronald T., to Sunkist Growers, Inc. Mobile platform structure for fruit pickers. 3,910,439, Cl. 214-520.000.
Rossell, Allen J., to Burroughs Corporation. AC to absolute value linear converter. 3,911,291, Cl. 307-229.000.
Rossi, Irving: *See—*
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Rosvold, Warren C., to Signetics Corporation. Semiconductor structure and method. 3,911,474, Cl. 357-71.000.
Rotaflex (Great Britain) Limited: *See—*
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Rother, Eberhard; and Beranek, Miroslav, to Vorwerk & Co. Elektrowerke KG. Vacuum cleaner construction. 3,909,875, Cl. 15-387.000.
Rother, Wolfgang: *See—*
Weber, Paul; Mollenkopf, Hans; Henning, Kurt; Heinemann, Otto; Schmits, Heinz-Herbert; Rother, Wolfgang; Ritzmann, Horst; Wurr, Jurgen; Krutzner, Karl, Jr.; Schossler, Werner; Goldmann, Wolf; and Schepers, Georg, 3,910,754.
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Rottmayr, Friedrich; Reimann, Hans; Schuster, Robert; Wagner, Walter; and Muller, Hans Joachim, to Linde Aktiengesellschaft; and Erdolchemie Gesellschaft mit beschrankter Haftung. Prevention of resin formation during absorption of CO_2 and/or H_2S from cracking gases. 3,911,082, Cl. 423-226.000.
Roughgarden, Jeffrey D.; and Leshnoff, Stephen D., to Westinghouse Electric Corporation. Gas turbine inlet vane structure utilizing a stable ceramic spherical interface arrangement. 3,910,716, Cl. 415-217.000.
Rounds, Donald E.: *See—*
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Rowe, Arthur W.; and Marshall, Edward T., to Union Carbide Corporation. Method of joining the ends of two conduits together in a sterile manner. 3,909,910, Cl. 29-423.000.
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Rowe, Richard A., to General Electric Company. Thermostat mounting device for plastic tub dishwasher. 3,911,247, Cl. 219-328.000.
Royal Industries, Inc.: *See—*
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Ruble, Ernest Burlin, to Whirlpool Corporation. Basket filter for automatic washing machines. 3,910,076, Cl. 68-18.00F.
Rudko, Paul: *See—*
Karageozian, Hampar L.; and Rudko, Paul, 3,910,296.
Ruegg, Heinz Walter, to U.S. Philips Corporation. Integrated circuit for logic purposes having transistors with different base thicknesses and method of manufacturing. 3,911,470, Cl. 357-36.000.
Ruhrchemie Aktiengesellschaft: *See—*
Lutze, Siegfried; Birnkraut, Hans-Walter; and Moser, Hubert, 3,910,870.
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Rumbaugh, Garry L. Adjustable ring wherein setting provides adjustment. 3,910,067, Cl. 63-15.600.

Runyon, Wilbur D.; and Dudugjian, Carl. Seat and couch structure. 3,910,630, Cl. 297-63.000.

Rushworth, Paul M.; McMillan, Robert W.; and Corcoran, Vincent J., to Martin-Marietta Corporation. Single pulse selection system. 3,910,679, Cl. 350-150.000.

Russiyan, Ljudmila Nikolaevna: *See—*
Belov, Gennady Petrovich; Dzhabiev, Taimuraz Savelievich; Dyachkovsky, Fridrikh Stepanovich; Smirnov, Vyacheslav Ivanovich; Karpova, Nelli Dzhavkharovna; Brikenshtein, Khaim-Mordkhe Aronovich; Gerasina, Matrena Petrovna; Kuzmin, Vladimir Evgenievich; Matkovsky, Petr Evgenievich; Russiyan, Ljudmila Nikolaevna; Pomogailc, Anatoly Dmitrievich; Chirkov, Nikolai Mikhailovich, deceased; and Chirkov, Mikhail Nikolaevich, administrator, 3,911,042.

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Rydberg, Sigge. Valve. 3,910,303, Cl. 137-112.000.

Ryden, James W.: *See—*
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S-B Manufacturing Co. Ltd.: *See—*
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Saburov, Vladimir Alexandrovich: *See—*
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Saiia, Anthony J.; Haffner, Donald G.; and Hoffmeyer, Knud H., to Jacobsen Manufacturing Company. Gang lawn mower. 3,910,016, Cl. 56-7.000.

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Saito, Fujio: *See—*
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Saito, Hiroshi; and Miyamoto, Kunito, to Matsushita Electric Industrial Co., Ltd. Remote controlled receiving apparatus which prevents erroneous operation due to noise. 3,911,367, Cl. 325-392.000.

Saito, Naoki: *See—*
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Saito, Takumi; and Hayashi, Shigeki, to Mitsui Fluorochemical Co., Ltd. Sintered micro-powder of tetrafluoroethylene polymers. 3,911,072, Cl. 264-117.000.

Saito, Yoshinori, to Kabushiki Kaisha Suwa Seikosha. Watch dial with interference colors. 3,910,033, Cl. 58-127.00R.

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Sakai, Kiyoshi; Kojima, Koichi; Yusa, Takashi; and Katano, Hamako, to Sankyo Company Limited. Process for the preparation of 2-formylcyclopentane derivatives. 3,910,965, Cl. 260-345.700.

Sakomura, Toshio; Kisaki, Hisashi; Mabuchi, Shunsuke; Tsutsumi, Yukihiro; and Tada, Takashi, to Toyo Soda Manufacturing Co., Ltd. Process for preparing 2-butene-1,4-diol from dichlorobutenes. 3,911,032, Cl. 260-636.000.

Sakurai, Toshio, to Fuji Shashin Koki Kabushiki Kaisha. Color selective low pass filter. 3,911,479, Cl. 358-44.000.

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Salkeld, Robert J. Dual fuel rocket engine. 3,910,037, Cl. 60-250.000.

Salomon, Georges Pierre Joseph, to S.A. Etablissements Francois Salomon & Fils. Safety fixing device for ski boots. 3,910,591, Cl. 280-11.35K.

Salvador Todaro V Hermane: *See—*
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Samanta, Shyam K., to Ford Motor Company. Apparatus and method for cold extrusion of gears. 3,910,091, Cl. 72-256.000.

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Sanders Associates, Inc.: *See—*
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Sanders, James Milton; and Michael, Loren Hall, to International Flavors & Fragrances Inc. Process for production of isochromans. 3,910,964, Cl. 260-345.200.

Sanders, James Milton; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. 2-(4-Hydroxy-4-methylpentyl)norbornadiene and process for preparing same. 3,911,028, Cl. 260-617.00F.

Sanders, James Milton: *See—*
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Sandmore, Donald K.: *See—*
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Galantay, Eugene E., 3,911,021.
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Sandoz Ltd.: *See—*
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Hochreuter, Richard; and Rabinowitz, Joseph, 3,910,970.

Sankey, George H.; and Whiting, Keith D. E., to Minnesota Mining and Manufacturing Company. Process for the preparation of α-(hydroxy and alkoxy substituted)phenyl-α-(2-piperidinyl)-methanols. 3,910,934, Cl. 260-293.840.

Sankyo Company Limited: *See—*
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Santilli, Arthur A.; Scotese, Anthony C.; and Tomarelli, Rudolph M., to American Home Products Corporation. (2-Pyrimidinylthio) alkanoic acids, esters, amides and hydrazides. 3,910,910, Cl. 260-251.00R.

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Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, 3,910,903.

Sapozhnikov, Zinovy Avramovich; Fridman, Iosif Lvovich; and Fridman, Moisei Zalmanovich. Arrangement for hoisting load. 3,910,559, Cl. 254-184.000.

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Sarnoff, Stanley J.; and Reinhold, Herbert E., Jr., to Survival Technology, Inc. Method and apparatus of treating heart attack patients prior to the establishment of qualified direct contact personal care. 3,910,260, Cl. 128-2.06R.

Saslow, Seymour, to Espey Mfg. & Electronics Corporation. Battery charging protective circuit for use in charging nickel cadmium batteries. 3,911,351, Cl. 320-39.000.

Sato, Haruhito; Shimizu, Nobuaki; Honna, Kosaku; and Kurisawa, Konomu, to Idemitsu Kosan Co. Ltd. Oxidative dehydrogenation process of aromatic compounds. 3,911,034, Cl. 260-650.00R.

Sato, Kazuo; and Takahashi, Soji, to Hitachi, Ltd. Method for manufacturing a shadow mask. 3,909,928, Cl. 29-557.000.

Sato, Reiji, to Amano Corporation. Operating device for perpetual calendar. 3,909,966, Cl. 40-107.000.

Sato, Tadashi: *See—*
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Sawada, Jiro; Misaki, Tetsuo; Hanada, Kazunori; Tamai, Masaharu; Yamagishi, Michio; Tsuji, Hikoji; Komiya, Kyoko; Nakajima, Takako; and Machida, Junichi, to Taisho Pharmaceutical Co. Ltd. Enzyme inhibitor specific against thiol protease and process for production thereof. 3,911,111, Cl. 424-118.000.

Sayigh, Adnan A. R.; Stuber, Fred A.; and Ulrich, Henri, to Upjohn Company, The. Novel compounds and process. 3,911,164, Cl. 427-53.000.

Saypalia, William E., Jr. Solar energy heat and cooling system. 3,910,490, Cl. 237-1.00A.

Sbragia, Ronald Joseph, to Dow Chemical Company, The. Systemic plant protectant methods employing certain pyridazines. 3,911,127, Cl. 424-250.000.

Scalza, Anthony J.; and Brown, William G., to Square D Company. Solenoid operated electric strike. 3,910,617, Cl. 292-341.160.

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Schaffner, Ernst; Eilingsfeld, Heinz; and Patsch, Manfred, to BASF Aktiengesellschaft. Production of 3,6-dihalodiphenylalkanes. 3,911,033, Cl. 260-649.00R.
Schanzer, Gunther; and Bohret, Hartmut Heiner, to Bodenseewerk Geratetechnik GmbH. Device for aircraft trajectory guidance. 3,911,436, Cl. 343-108.00R.
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Scheller, Frieder; Megges, Rudolf; Dittrich, Frank; Repke, Kurt; Portius, Hans Joachim; Kammann, Gunter; Schmidt, Hans-Jorg; and Haustein, Knut-Olaf, to Veb Arzneimittelwerk Dresden. Method for the production of nitric esters of hydroxysteroid lactones or their glycosides. 3,910,881, Cl. 260-210.500.
Schenkenberg, Philip R.; and Williams, Charles R., to Monsanto Company. 1,3,2-Diazaphospholidine compounds. 3,911,005, Cl. 260-551.00P.
Schepers, Georg: *See—*
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Scheuermann, Horst; Augart, Dietmar; and Mach, Wolfgang, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. N-substituted iminocoumarin dyes. 3,910,912, Cl. 260-256.40Q.
Scheuermann, Kurt P. Car wash apparatus. 3,909,865, Cl. 15-21.00D.
Schibbye, Lauritz Benedictus: *See—*
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Schick Incorporated: *See—*
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Schieber, Hans; and Krause, Erich, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Straight knitting machines with circulating sliding heads. 3,910,071, Cl. 66-64.000.
Schieber, Hans: *See—*
Krause, Erich; and Schieber, Hans, 3,910,073.
Schinella, Richard D.; and Anthony, Michael P., to Fairchild Camera and Instrument Corporation. Method for forming a continuous layer of silicon dioxide over a substrate. 3,911,168, Cl. 427-93.000.
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Schittek, Friedrich; and Zimmermann, Heino, to Gustav F. Gerdts KG. Probe for controlling the level of electrically conductive liquids. 3,910,118, Cl. 73-304.00R.
Schlanzky, Manfred P. H., to General Motors Corporation. In-tank fuel pump support unit and assembly. 3,910,464, Cl. 222-180.000.
Schlecht, Helmut: *See—*
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Schlichte, Max, to Siemens Aktiengesellschaft. Digital-to-analog converter. 3,911,427, Cl. 340-347.0DA.
Schlig, Eugene Stewart: *See—*
Alt, Paul Matthew; Pleshko, Peter; and Schlig, Eugene Stewart, 3,911,421.
Schlittler, Jacques Roby. Hay-making machine. 3,910,019, Cl. 56-367.000.
Schlotfeldt, Walter A., to Med-Con Engineering. Apparatus for producing contact lenses. 3,909,982, Cl. 51-58.000.
Schmermund, Alfred. Device for wrapping block-like articles. 3,910,012, Cl. 53-234.000.
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Schmidt, James R.; and Franklin, Mark E. Denture and method of making the same. 3,909,944, Cl. 32-2.000.
Schmidt, Joachim; and Unruh, Martin. Copy paper. 3,911,195, Cl. 428-411.000.
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Schouten, James J.; and Wargin, Robert V., to Richardson Company, The. Cross-linked ultra high molecular weight polyethylene and S-B copolymer composition and process for molding. 3,911,051, Cl. 260-876.00B.
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Schwartz, Jay Martin, to Chromalloy Photographic Industries, Inc. Front projection apparatus. 3,911,450, Cl. 354-77.000.
Schwarz, Gunter. Arrangement for securing a body by means of an adhesive bond. 3,910,593, Cl. 280-11.37E.
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Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
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Societe Nouvelle de Roulements: *See—*
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Soderman, Kenneth L., to Boeing Company, The. Safety system for hydrofoil craft. 3,910,215, Cl. 114-66.50H.

Sofer, George A., to General Atomic Company. Method for increasing the burn-up capability of boiling water nuclear reactors containing plutonium-bearing fuel assemblies. 3,910,818, Cl. 176-54.000.

Sokolow, Nickolas N., to Beloit Corporation. Parison unloader. 3,910,430, Cl. 214-21.000.

Sol, Cornelis, to Van Der Molen Machinefabriek B.V. Device for counting and grouping substantially pin-shaped products during transport. 3,910,401, Cl. 198-24.000.

Solar, James M.: *See—*
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Son, Pyong-Nae, to B. F. Goodrich Company, The. Vulcanizable rubber compositions. 3,910,864, Cl. 260-79.50B.

Sone, Masao; Arai, Kojiro; and Nomura, Katsuaki, to Japan Exlan Company, Limited. Acrylic fiber product having animal hairy hand. 3,910,026, Cl. 57-140.0BY.

Sone, Yoshiaki; and Kashiwagi, Kazuo, to Canon Kabushiki Kaisha. Photographic apparatus. 3,910,698, Cl. 355-54.000.

Songer, Larry A., to Addressograph Multigraph Corporation. Sheet material feeder. 3,910,567, Cl. 271-42.000.

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Speedie, Robert. Valve. 3,910,554, Cl. 251-208.000.
Spellman, Patrick J.: *See—*
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Spence, Gary W.; Wienhold, James L.; and Kveberg, Larry E., to CPT Corporation. Search feature for an automated typing system. 3,911,489, Cl. 360-72.000.
Spencer, Henry C. Toilet roll paper moistening device. 3,910,229, Cl. 118-43.000.
Spero, Donald M.; Eastlund, Bernard J.; and Urv, Michael G., to Fusion Systems Corporation. Method and apparatus for generating electromagnetic radiation. 3,911,318, Cl. 315-39.000.
Sperry, Gene, to American Chain & Cable Company, Inc. High temperature vacuum pad lift. 3,910,620, Cl. 294-64.00R.
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Spindler, John Edward. Lateral displacement of crop lying on the ground. 3,910,020, Cl. 56-370.000.
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Sprandel, Harold R. Swivel-mounted hunting arrowhead. 3,910,579, Cl. 273-106.50B.
Sprandel, Harold R. Motorized archery sight and range finder. 3,910,700, Cl. 356-21.000.
Sprenger, William K., to G. D. Searle & Co. N-substituted N-benzyloxy-2-methyl-2-(4-halophenoxy)propionamides. 3,911,007, Cl. 260-559.00B.
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Springer, Edward M., to Heyer Inc. Quick coupling for the drum of a duplicating duplicator. 3,910,184, Cl. 101-116.000.
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Stachiw, Jerry D., to United States of America, Navy. Inflatable ice igloo. 3,909,992, Cl. 52-2.000.
Stafford, Richard D. Apparatus and method for separating particles having different coefficients of friction. 3,910,835, Cl. 209-115.000.
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Stauffer, Ammon W.; and Lowry, Robert W., to A.W. Stauffer and Sons, Inc.; and Portable Mills, Inc. Mixing apparatus for fluent material. 3,910,508, Cl. 241-101.00B.
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Sterling, Walter S., to Pneumatic Scale Corporation. Closure handling and orienting apparatus. 3,910,407, Cl. 198-268.000.
Stevens, Philip M., to United States of America, Army. One watt/one amp no-fire match type initiator. 3,910,188, Cl. 102-28.00M.
Steward, Joseph H., to Multifastener Corporation. Method of forming nut and panel assembly. 3,909,927, Cl. 29-526.000.
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Steward, William L., to Steward Plastics, Inc. Apparatus for making helically wound plastic tubing. 3,910,808, Cl. 156-429.000.
Stewart, Jeffrey Lee, to Bio-Med Devices, Inc. Portable volume cycle respirator. 3,910,270, Cl. 128-145.800.
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Stoughton, Dan T. Therapeutic apparatus. 3,910,262, Cl. 128-40.000.
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Strack, John K. Ring having recessed stone secured by plastic material thereunder. 3,910,066, Cl. 63-15.000.
Strang, Virgil G. Anti-smog electrical welding apparatus and multiple energy supply conduit. 3,911,242, Cl. 219-130.000.
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Suverkropp, Geertrudes H.; and Reichrath, Werner, to Stamicarbon N.V. Process for the preparation of lysine involving 1-ureido-4-cyanovaleramide and 1-ureido-5-aminocapronamide intermediaries. 3,911,001, Cl. 260-534.00L.
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Svoboda, Vladimir; Skopalik, Josef; and Ptacek, Jaroslav, to Elitex, Zavody textilniho strojirenstvi. Method of, and apparatus for, making stitch-bonded fabric. 3,910,072, Cl. 66-85.00A.
Swadner, Robert L.; and Gaines, Marvin E., to General Motors Corporation. Split cylinder radial-four automotive air conditioning compressor. 3,910,164, Cl. 92-128.000.
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Szasz, I. Emery, to Sandborn, Edmund, a part interest. Floating cover for a storage tank. 3,910,452, Cl. 220-226.000.

Szedon, John R.; Jackson, John A.; and Phillips, David C., to Westinghouse Electric Corporation. Encapsulated solid state electronic devices having a sealed lead-encapsulant interface. 3,911,475, Cl. 357-72.000.

Tabacchi, Giuseppe, to Comitato Nazionale Per L'Energia Nucleare & Chen. Hydraulic multicellular sealing device for centrifugal pumps. 3,910,585, Cl. 277-14.000.

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Tailhardat, Franck, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Mandrel for shaping pipes. 3,910,098, Cl. 72-466.000.

Taisho Pharmaceutical Co. Ltd.: *See*—
Sawada, Jiro; Misaki, Tetsuo; Hanada, Kazunori; Tamai, Masaharu; Yamagishi, Michio; Tsuji, Hikoji; Komiya, Kyoko; Nakajima, Takako; and Machida, Junichi, 3,911,111.

Takada, Juichiro, legal representative authorized heir: *See*—
Takada, Takezo, deceased, 3,910,525.

Takada, Takezo, deceased (by Takada, Juichiro, legal representative authorized heir), to Takata Kojyo Co., Ltd. Automatic locking safety belt reel. 3,910,525, Cl. 242-107.400.

Takahashi, Isoji, to Fuji Photo Film Co., Ltd. Method of and apparatus for forming electrostatic latent images. 3,911,335, Cl. 317-262.00A.

Takahashi, Soji: *See*—
Sato, Kazuo; and Takahashi, Soji, 3,909,928.

Takai, Isao, to Oda, Gosen Kogyo Kabushiki Kaisha. False-twisting apparatus for producing crimps in filament yarns. 3,910,025, Cl. 57-77.400.

Takai, Keiji: *See*—
Kariyone, Kazuo; Tanaka, Kunihiko; and Takai, Keiji, 3,910,939.

Takamiya, Saburo: *See*—
Fujikawa, Kyoichiro; and Takamiya, Saburo, 3,911,468.

Takano, Akiyoshi: *See*—
Fujita, Hideo; Hachisuka, Kozo; Furukawa, Kiyoshi; Matsutani, Tsutomu; Kobayashi, Kei; Yonekura, Shiro; Takano, Akiyoshi; and Nakazawa, Hiroshi, 3,911,069.

Takano, Yutaka: *See*—
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Takasaki, Akira; Shima, Yoshio; and Hayashi, Takehiko, to Toyoda Koki Kabushiki Kaisha. Control system for plural numerically controlled machine tools. 3,909,922, Cl. 29-563.000.

Takata Kojyo Co., Ltd.: *See*—
Takada, Takezo, deceased, 3,910,525.

Takayama, Katsuki: *See*—
Kobashi, Uichiro; Inada, Masami; and Takayama, Katsuki, 3,910,643.

Takayama, Shiro: *See*—
Tomita, Tamaki; Yamada, Ryoji; and Takayama, Shiro, 3,909,989.

Takeda, Minoru, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for independent color control of alphanumeric display and background therefor. 3,911,418, Cl. 340-324.0AD.

Takegawa, Hiroyasu: *See*—
Kurimoto, Mikishi; and Takegawa, Hiroyasu, 3,909,923.

Takemoto, Takeshi: *See*—
Isa, Hiroshi; Inomiya, Takeshi; Karube, Kenji; Takemoto, Takeshi; and Nagayama, Masuzo, 3,910,973.

Takemoto, Toyoki, to Matsushita Electric Industrial Co., Ltd. MOS type semiconductor IC device. 3,911,289, Cl. 307-205.000.

Takemura, Takehide; and Minami, Shunji, to Matsushita Electric Industrial Co., Ltd. Electric charge holding device. 3,911,348, Cl. 320-1.000.

Takemura, Tooji: *See*—
Moori, Yooichi; and Takemura, Tooji, 3,910,388.

Takeuchi, Yasuhisa; and Iizuka, Haruhiko, to Nissan Motor Company Limited. Anti-lock brake system including a center brake control booster device and a wheel master cylinder assembly. 3,910,645, Cl. 303-21.00F.

Takeuchi, Yasuhisa, to Nissan Motor Company Limited. Skid control system. 3,910,647, Cl. 303-21.00A.

Takeyama, Hidehiko: *See*—
Miyazawa, Shinichi; Takeyama, Hidehiko; and Miyasaka, Kaneyoshi, 3,909,986.

Takimoto, Masaaki: *See*—
Honjo, Satoru; and Takimoto, Masaaki, 3,911,170.

Takizawa, Hideo; Aida, Hiroyuki; Miyabayashi, Yoshiyuki; and Tsuneishi, Norihiro, to Nissan Motor Company, Limited. Method of joining the edge portions of two sheets. 3,909,918, Cl. 29-509.000.

Takizawa, Hideo: *See*—
Miyabayashi, Yoshiyuki; Takizawa, Hideo; Tsuneishi, Norihiro; and Aida, Hiroyuki, 3,909,919.

Tal, Aharon. Tensiometer and automatic irrigation control system utilizing same. 3,910,300, Cl. 137-78.000.

Talis, Nikolai Semenovich; and Matjushenko, Vitaly Ivanovich. Feeding device for a rotary tablet machine. 3,910,739, Cl. 425-209.000.

Talonn, Daniel A., to Sherwood Medical Industries Inc. Body member tourniquet. 3,910,280, Cl. 128-327.000.

Tamai, Masaharu: *See*—
Sawada, Jiro; Misaki, Tetsuo; Hanada, Kazunori; Tamai, Masaharu; Yamagishi, Michio; Tsuji, Hikoji; Komiya, Kyoko; Nakajima, Takako; and Machida, Junichi, 3,911,111.

Tamura, Yasumitsu; Nakagawa, Kazuyuki; Yoshizaki, Shiro; and Murakami, Nanami, to Otsuka Pharmaceutical. 3,4-Dihydrocarbostyril derivatives and a process for preparing the same. 3,910,924, Cl. 260-288.00R.

Tanaka, Kunihiko: *See*—
Kariyone, Kazuo; Tanaka, Kunihiko; and Takai, Keiji, 3,910,939.

Tanaka, Seiji: *See*—
Miki, Tomonori; and Tanaka, Seiji, 3,911,137.

Tanaka, Susumu; Kawabata, Hidetoshi; and Enoguchi, Yuji, to Minolta Camera Kabushiki Kaisha. Residual toner removing apparatus. 3,909,864, Cl. 15-1.500.

Tanaka, Toshihiro: *See*—
Ohno, Eiji; Tanaka, Toshihiro; and Yamashita, Hisateru, 3,910,127.

Tanferna, Mario; Mascioli, Alessandro; Ciminelli, Angelo; Polo, Franco; and Boschetto, Carlo. Water lifting device. 3,910,726, Cl. 417-240.000.

Taniguchi, Koichi: *See*—
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Tanikella, Murty S., to Du Pont de Nemours, E. I., and Company. Fibers of acid-dyeable polyester having terminal tetramethylpiperidine groups. 3,910,860, Cl. 260-76.000.

Tanimoto, Kenji: *See*—
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Ebara, Kazunari; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; and Yasuda, Minoru, 3,911,030.

Tanner, Howard Carl: *See*—
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Tarczy-Hornoch, Zoltan. Phase interpolating apparatus and method. 3,911,368, Cl. 328-155.000.

Tarr, Robert Earl: *See*—
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Taylor, Brian W.: *See*—
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Taylor, Jimmy N.: *See*—
Taylor, Miller; Taylor, Jimmy N.; and Taylor, Oren M., 3,910,757.

Taylor, Jordan M., to International Business Machines Corporation. Parity prediction and checking network. 3,911,261, Cl. 235-153.0AP.

Taylor, Miller; Taylor, Jimmy N.; and Taylor, Oren M. Mobile tobacco curing and drying system. 3,910,757, Cl. 432-500.000.

Taylor, Oren M.: *See*—
Taylor, Miller; Taylor, Jimmy N.; and Taylor, Oren M., 3,910,757.

Taylor, Robert J.; and Beard, Richard M., to United States of America, Navy. Propellant-actuated deep water anchor. 3,910,218, Cl. 114-206.00A.

Tazaki, Yonesiro: *See*—
Kawabata, Jun-Ichi; Tazaki, Yonesiro; Mitsui, Shigeo; and Niikawa, Kazuhiko, 3,910,849.

Tecmed A.G.: *See*—
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Teijin Limited: *See*—
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Tektronix Inc.: *See*—
Rhodes, Charles W., 3,911,478.

Telang, Yeshwant P., to Ford Motor Company. Composite apex seal. 3,910,734, Cl. 418-178.000.

Tele-Sensors, Inc.: *See*—
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Teledyne Pines: *See*—
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Tenneco Inc.: *See—*
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Sheridan, Richard C.; and McCullough, John F., 3,911,086.
Tension Structures Co.: *See—*
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Terao, Yoshikazu, to Victor Company of Japan, Ltd. Automatic tape loading recording-reproducing apparatus of drum rotation type. 3,911,491, Cl. 360-85.000.
Terashima, Toshikatu: *See—*
Kubota, Toshihiro; and Terashima, Toshikatu, 3,910,398.
ter Braak, Johannes Gerardus, to Gebrs. Ter Braak B.V. Mixer. 3,910,346, Cl. 165-109.000.
Terraillon: *See—*
Terraillon, Marc, 3,910,366.
Terraillon, Marc, to Terraillon. Weighing. 3,910,366, Cl. 177-225.000.
Tersch, Richard W., to Lear Siegler, Inc. Finishing hypoid gears. 3,909,990, Cl. 51-287.000.
Teshima, Tsunehiko: *See—*
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Cummings, William M., 3,910,987.
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Thatcher, Russell S., to Central Welding Supply Co. Circumferential track and band assembly with quick release. 3,910,480, Cl. 228-45.000.
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Theodor Grabener Maschinenfabrik: *See—*
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Thermo Electron Corporation: *See—*
Syska, Andrew J., 3,910,755.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Track tamper and leveler. 3,910,195, Cl. 104-12.000.
Thiel, Alfons Wilhelm. Thin-walled stackable shallow containers such as dishes, plates and the like. 3,910,415, Cl. 206-520.000.
Thimon, Hubert A.; and Levante, Gregoire, to Societe d'Applications Thermiques. Process and machine for packing. 3,910,005, Cl. 53-3.000.
Thomanek, Franz Rudolf: *See—*
Held, Manfred; Spies, Johann; and Thomanek, Franz Rudolf, 3,911,391.
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Thomas, John F.: *See—*
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Thomason, Harry E.; and Thomason, Harry Jack Lee, Jr. Flat roof solar heated building. 3,910,253, Cl. 126-271.000.
Thomason, Harry Jack Lee, Jr.: *See—*
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Thome, William L., to Midland-Ross Corporation. Furnace fan assembly. 3,910,717, Cl. 415-219.00C.
Thompson, George Horace B., to International Standard Electric Corporation. Gallium arsenide injection lasers. 3,911,376, Cl. 331-94.50H.
Thompson, Hugh A.; and Bauer, F. Michael, Jr. Failsafe device. 3,910,224, Cl. 116-114.00R.
Thompson, Robert M., to Sun Ventures, Inc. Tertiary diamides. 3,910,847, Cl. 252-77.000.
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Thorud, Richard A.; and Christopherson, Herman P., to Toro Company, The. Rotary mower blade. 3,910,017, Cl. 56-295.000.
Throckmorton, Morford C., to Goodyear Tire & Rubber Company, The. Chemical process. 3,910,869, Cl. 260-94.300.
Tiede, Ray E. Ground rod driving device. 3,910,556, Cl. 254-29.00R.
Tildesley, James Matthew George, to Ocean Investments (Gibraltar) Limited. Method of joining sheets by use of fasteners. 3,909,913, Cl. 29-432.000.
Tilley, Nicholas: *See—*
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Tilse, Wilhelm Paul, to Timex Corporation. Alarm device for a wristwatch external to the movement. 3,910,034, Cl. 58-152.00B.
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Tirpak, George; and Stanaback, Robert J., to Tenneco Chemicals, Inc. Biocidal solutions for use in polyvinyl halide resin compositions. 3,911,135, Cl. 424-274.000.
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Todaro, Salvador, to Salvador Todaro V Hermane. Packing for valve stems used in internal combustion engines. 3,910,586, Cl. 277-48.000.
Todd, Lee T., Jr.; Farrell, Eugene F.; and Linz, Arthur, to Massachusetts Institute of Technology. Cathode ray tube whose image screen is both cathodochromic and fluorescent and the material for the screen. 3,911,315, Cl. 313-391.000.
Tohma, Takaaki, to Sony Corporation. Drop-out compensating circuit. 3,911,208, Cl. 178-6.6DC.
Tokyo Shibaura Denki Kabushiki kaisha: *See—*
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Tomita, Tamaki; Yamada, Ryoji; and Takayama, Shiro, to Toyoda Machine Works, Ltd. Grinding machine with feed rate changing device. 3,909,989, Cl. 51-165.770.
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Torresdal, David N. Digital counting method and apparatus. 3,911,253, Cl. 235-92.0FQ.
Torti, Maurice L., Jr.; and Richerson, David W., to Norton Company. High strength composite ceramic structure. 3,911,188, Cl. 428-218.000.
Totten, Donald R., to United States of America, Navy. Adaptive control system using command tailoring. 3,911,345, Cl. 318-561.000.
Tower, Ronald H. Water testing device. 3,910,764, Cl. 23-253.00R.
Townsend, Peter Keith, to AMP Incorporated. Printed circuit board terminal receptacle. 3,910,671, Cl. 339-97.00R.
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Trotman, Herbert H. Perforate composite and continuous-strip manufacturing methods and apparatus. 3,911,186, Cl. 428-137.000.

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Trouilhet, Maurice Marie Achille, to Seb S.A. Small-sized dishwashing machine. 3,910,499, Cl. 239-228.000.

Troutner, Arthur L., to Trus Joist Corporation. Continuous, laminated-platen press for pressing glue-coated press charges. 3,910,179, Cl. 100-154.000.

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Tsuji, Teruaki; and Watanabe, Shigeru, to Tokyo Shibaura Denki Kabushiki kaisha. Method and apparatus for removing an incore neutron flux monitor. 3,910,816, Cl. 176-19.00R.

Tsuneishi, Norihiro: *See—*
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Tsurushima, Katsuaki, to Sony Corporation. Multisound reproducing apparatus. 3,911,220, Cl. 179-1.0GQ.

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Tuomarla, Juhani; Raisanen, Kalervo; and Arvinen, Aulis, to Kemira Oy. Slime inhibitor for use in industrial water recirculating systems. 3,910,839, Cl. 210-60.000.

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Turner, Frank E.; and Andries, David, to Rockwell International Corporation. Leak clamp for bell and spigot pipe joint. 3,910,610, Cl. 285-337.000.

Turner, Gordon James, to W. R. Grace & Co. Contoured monolithic substrate. 3,910,850, Cl. 252-455.00R.

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Tusing, Arthur P. Radiator cap. 3,910,451, Cl. 220-203.000.

Tyrone, Murray Gene. Atomizer. 3,910,501, Cl. 239-417.500.

Uchida, Yosuke: *See—*
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Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Self-processing camera. 3,911,452, Cl. 354-83.000.

Ueda, Yuji: *See—*
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Uhlir, Pavel; and Kouklik, Ivo, to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi. Apparatus for controlling the needle selectors in a circular knitting machine. 3,910,070, Cl. 66-50.00R.

Ujihara, Motohiro: *See—*
Kaneko, Shiro; Masuda, Sakae; Ujihara, Motohiro; and Uchida, Yosuke, 3,910,812.

Ujiie, Akira, to Mitsubishi Jukogyo Kabushiki Kaisha. Process and apparatus for producing bent tubes. 3,910,340, Cl. 164-52.000.

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Union Corporation: *See—*
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National Aeronautics and Space Administration; administrator; with respect to an invention of:
Cleveland, Garry J.; Loh, George M.; Luce, Robert S.; Belasco, Norman; Lipanovich, Marko I.; Petersen, Howard L.; Pool, Sam L.; and Mangold, Donald W. Medical subject monitoring systems. 3,910,257, Cl. 128-2.10A.

National Aeronautics and Space Administration; adminstrator; with respect to an invention of:
Perlman, Marvin. Nonlinear nonsingular feedback shift registers. 3,911,330, Cl. 328-37.000.

National Aeronautics and Space Administration: *See*—
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Uram, Robert; and Waldron, Gerald E., to Westinghouse Electric Corporation. System and method for operating a steam turbine with a control system having a turbine simulator. 3,911,286, Cl. 290-40.000.

Urbanic, John M., to Aluminum Company of America. Collapsible back-up tool. 3,910,481, Cl. 228-49.000.

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Van der Gaag, Cornelis, to N.V. Industrieele Handelscombinatie Holland. Coupling means for a floating conduit with a mooring-buoy. 3,910,609, Cl. 285-24.000.

van der Lely, Cornelis. Rotatable soil engaging attachments. 3,910,356, Cl. 172-552.000.

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Van Paesschen, August Jean; Van Gossum, Lucien Janbaptist; and Priem, Jan Jozef, to Agfa-Gevaert N.V. Adhesion of hydrophilic layers on polyester film. 3,911,172, Cl. 427-171.000.

Van Petten, Louis B., to Brunswick Corporation. Strand stripper and reclaimer. 3,910,021, Cl. 57-1.0UN.

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Yokoyama, Henry; Hsu, Wan-Jean; and Poling, Stephen M., to United States of America, Agriculture. Method for coloring fruits and vegetables. 3,911,150, Cl. 426-268.000.
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Zoukourian, Marc K. Device for prevention and protection against fire and explosion in the lines of the treatment of inflammable comminuted products. 3,909,954, Cl. 34-44.000.
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Zunkel, Richard L., to Eaton Corporation. Door closer assembly preventing misalignment of closer and arm. 3,909,876, Cl. 16-71.000.
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LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Anderson, Allan A., and J. W. Moore, to International Business Machines Corp. Microprogram control system. T939,006, 10–7–75, Cl. 340—172.5.

Baldwin, Willett F., and V. R. Slover, Jr., to Mobil Oil Corp. Manifold for flow monitoring means. T939,012, 10–7–75, Cl. 137—599.1

Barbee, Robert B. Process for preparing a polyester fabric having desirable stain-release, antisoil-redeposition, antistatic and hydrophilic properties. T939,008, 10–7–75, Cl. 8—115.5.

Bender, Richard A., and E. L. Pottorff, to International Business Machines Corp. Program test method. T939,010, 10–7–75, Cl. 444—1.

Caldwell, John R., and J. M. McIntire. Hot melt rewettable adhesive compositions. T939,013, 10–7–75, Cl. 260—32.6.

Chamberlin, Donald D., to International Business Machines Corp. Scheduling mechanism for interactive systems with virtual memory. T939,009, 10–7–75, Cl. 444—1.

Clarke, Kenneth, and T. A. Stanley, to Imperial Chemical Industries Ltd. Pressing. T939,001, 10–7–75, Cl. 100—38.

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Enegess, David N., Paquette, and Elsherif. T939,005.

Comtois, Wilfred H.: *See*—
Patterson, John F., and Comtois. T939,002.

Douglas, Ted L., and A. J. Clonce, Jr. Production of flexible polyurethane foam. T939,016, 10–7–75, Cl. 260—2.5.

Enegess, David N., P. D. Paquette, and H. N. Elsherif, to Combustion Engineering, Inc. Spent regenerant processing system. T939,005, 10–7–75, Cl. 252—301.1.

Elsherif, Hashem N.: *See*—
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Foster, Lloyd P.: *See*—
Fudge, Thomas G., Murphy, and Foster. T939,014.

Fudge, Thomas G., J. J. Murphy, and L. P. Foster. Method and device for mending ruptures in a balloon-type articles. T939,014, 10–7–75, Cl. 264—36.

Imperial Chemical Industries, Ltd.: *See*—
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Kelley, Warren J., and Larson. T939,004.
Mauceri, Richard C., St. Germaine, and Schulze. T939,-011.

Itoh, Katsumi, to Nippondenso Co., Ltd. Voltage regulating system. T939,015, 10–7–75, Cl. 320—64.

Kelley, Warren J., and L. E. Larson, to International Business Machines Corp. Algorithm for page reclamation via change bit recording in relocatable CPU environments. T939,004, 10–7–75, Cl. 444—1.

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Maggiulli, Cataldo A., and R. J. Schottmiller. Method for synthesis of 1-formyl-2-(p-tolyl) hydrazine. T939,003, 10–7–75, Cl. 260—562.

Mauceri, Richard C., R. J. St. Germaine, and E. S. Schulze, to International Business Machines Corp. Dynamic extension of allocation for new unit. T939,011, 10–7–75, Cl. 444—1.

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Pacific Lighting Service Co.: *See*—
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Paquette, Philip D.: *See*—
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Schottmiller, Richard J.: *See*—
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Schulze, Eugene S.: *See*—
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Seliber, Joseph, to Pacific Lighting Service Co. Methane cooled desalination method and apparatus. T939,007, 10–7–75, Cl. 62—58.

Slover, Vasel R., Jr.: *See*—
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Stanley, Thomas A.: *See*—
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Eresa S.A.: *See*—
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Matthey, Henri; and Bessire, Jean Jacques, to Eresa S.A. Phase and speed control of a DC motor. Re. 28,567, Cl. 318-314.000.

Xerox Corporation: *See*—
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Bartlett, Joseph E. Faucet and valve seat dressing stone. 237,039. 10–7–75, Cl. D8—90.
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Holland, Richard G. Digging tooth. 237,097, 10–7–75, Cl. D39—1.
Holland, Richard G. Digging tooth. 237,098, 10–7–75, Cl. D39—1.
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Teraoka, Kazuharu, to Teraoka Seikosho Co., Ltd., Platform scale. 237,062, 10–7–75, Cl. D10—91.
Teraoka Seikosho Co., Ltd.: *See*—
Teraoka, Kazuharu. 237,062.
Tilley, Alvin R.: *See*—
Genaro, Donald M., and Tilley. 237,109.
Tokeim Corp.: *See*—
Loy, John S., Robbins, and Hankel. 237,101.
Uniroyal, Inc.: *See*—
Martin, Frank S., and Pietraszek. 237,094.
Newman, James F. 237,065.
Smajd, Carl F. 237,066.
Upjohn Co., The: *See*—
Pochyla, Gerald L., and Smith. 237,092.
Vogt, Franz, to Voko Franz Vogt & Co. Combined chair and table unit. 237,026, 10–7–75, Cl. D6—42.
Vogt, Franz Voko, & Co.: *See*—
Vogt, Franz. 237,026.
Walden, Hans E.: *See*—
Froidh, Tor A., Walden, and Widlund. 237,114.
Walker, Thomas A., to Music Man, Inc. Combined amplifier and loudspeaker for electrical musical instruments. 237,089, 10–7–75, Cl. D26—14.
Weathershields Ltd.: *See*—
Fisher, John A. 237,103–4.
Webber, Peter J.: *See*—
Ruskin, Bryan E. S., and Webber. 237,051.
Westgerdes, James J., to Premiere Corp. Holder for retaining a plurality of panels at the corners thereof. 237,056, 10–7–75, Cl. D9—293.
Westrich, James L., to Algoma Net Co. Bottle or the like. 237,047, 10–7–75, Cl. D9—63.
Whiteford, Tim W., and H. E. Freeman, Jr. Bow and arrow trigger. 237,071, 10–7–75, Cl. D22—5.
Whitney, Dale E. Trailer. 237,064, 10–7–75, Cl. D12—105.
Widlund, Leif U. R.: *See*—
Froidh, Tor A., Walden, and Widlund. 237,114.
Wiebe, Walter W. Display station and data communications terminal. 237,088, 10–7–75. Cl. D26—5.
Wilson, George A., to Ampex Corp. Magnetic tape hand punch. 237,070, 10–7–75, Cl. D19—72.
Withnall, Malcolm D. N. to Mars Ltd. Vending machine. 237,102, 10–7–75, Cl. D52—3.
Yanagawa, Haruo, to Ashida Onkyo Kabushiki Kaisha. Earphone. 237,090, 10–7–75, Cl. D26—14.

CL
2
3R
19
79
132
224R
CL
1.9
1.91
1.911
16
CL
67A
CL
164R
348WB
348R
CL
14.25
CL
41R
115.7
184
186
CL
142R
CL
17
CL
1.5
21D
22R
24
27
49R
121
182
250.02
306B
339
387
CL
71
85
121
164
CL
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42
CL
93
CL
232R
253R
254E
260
264
277C
277R
284
288FB
288E
288F
297
CL
16PB
73SA
73P
122.6
205.11R
221R
248A
CL
56
CL
4R
21
72.2R
CL
25.42
95A
95R

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 7, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
2 3,909,847
3R 3,909,846
19 3,909,848
79 3,909,849
132 3,909,850
224R 3,909,851

CLASS 3
1.9 3,909,852
1.91 3,909,853
1.911 3,909,854
16 3,909,855

CLASS 4
67A 3,909,856

CLASS 5
164R 3,909,857
348WB 3,909,859
348R 3,909,858

CLASS 7
14.25 3,909,860

CLASS 8
41R 3,910,758
115.7 3,910,759
184 3,909,861
186 3,910,760

CLASS 12
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CLASS 14
17 3,909,863

CLASS 15
1.5 3,909,864
21D 3,909,865
22R 3,909,866
24 3,909,867
27 3,909,868
49R 3,909,869
121 3,909,870
182 3,909,871
250.02 3,909,872
306B 3,909,873
339 3,909,874
387 3,909,875

CLASS 16
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85 3,909,877
121 3,909,878
164 3,909,879

CLASS 17
32 3,909,880
3,909,881
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CLASS 21
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CLASS 23
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253R 3,910,764
254E 3,910,765
260 3,910,766
264 3,910,767
277C 3,910,762
277R 3,910,768
284 3,910,769
288FB 3,910,770
288E 3,910,771
288F 3,910,772
297 3,910,773

CLASS 24
16PB 3,909,885
73SA 3,909,884
73P 3,909,883
122.6 3,909,886
205.11R 3,909,887
221R 3,909,888
248A 3,909,889

CLASS 26
56 3,909,890

CLASS 28
4R 3,909,891
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72.2R 3,909,893

CLASS 29
25.42 3,909,894
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95R 3,909,896
156.4R 3,909,897
157.3AH 3,909,898
157.3D 3,909,901
183.5 3,910,774
203DT 3,909,900
203H 3,909,899
205E 3,909,902
224 3,909,903
229 3,909,904
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271 3,909,905
407 3,909,906
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417 3,909,908
420.5 3,909,909
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427 3,909,911
428 3,909,912
432 3,909,913
433 3,909,914
509 3,909,918
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526 3,909,927
527.2 3,909,921
557 3,909,928
563 3,909,922
568 3,909,923
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592 3,909,930
596 3,909,931
603 3,909,932
626 3,909,933
628 3,909,934
3,909,935
629 3,909,936

CLASS 30
4R 3,909,937
34.1 3,909,938
34.2 3,909,939
47 3,909,940
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216 3,909,943

CLASS 32
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14D 3,909,945
26 3,909,946

CLASS 33
23G 3,909,947
126.5 3,909,948
129 3,909,949
143R 3,909,950
178R 3,909,951
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CLASS 34
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45 3,909,955
57R 3,909,956
92 3,909,957
166 3,909,958

CLASS 35
48R 3,909,959

CLASS 37
63 3,909,960
116 3,909,961
117.5 3,909,962
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CLASS 38
143 3,909,964

CLASS 40
32 3,909,965
107 3,909,966
336 3,909,967
358 3,909,968

CLASS 43
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3 3,909,970
6.5 3,909,971
8 3,909,972
42.31 3,909,973
3,909,974
124 3,909,975

CLASS 44
13 3,910,775
62 3,910,776

CLASS 46
79 3,909,976
191 3,909,977

CLASS 47
1.2 3,909,978
55 3,909,979

CLASS 49
199 3,909,980
340 3,909,981

CLASS 51
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82R 3,909,984
96 3,909,983
124R 3,909,985
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163 3,909,988
165.77 3,909,989
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309 3,909,991

CLASS 52
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63 3,909,993
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79 3,909,995
177 3,909,996
188 3,909,997
223 3,909,998
249 3,909,999
259 3,910,000
281 3,910,001
283 3,910,002
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758D 3,910,004

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124A 3,910,011
234 3,910,012
291 3,910,013
373 3,910,014

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CLASS 55
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102 3,910,778
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158 3,910,780
305 3,910,781
444 3,910,782

CLASS 56
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295 3,910,017
350 3,910,018
367 3,910,019
370 3,910,020

CLASS 57
1UN 3,910,021
34AT 3,910,022
58.95 3,910,023
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77.4 3,910,025
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157TS 3,910,027

CLASS 58
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50R 3,910,029
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88R 3,910,031
125C 3,910,032
127R 3,910,033
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CLASS 60
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CLASS 62
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188 3,910,060
290 3,910,061
406 3,910,062
514 3,910,063
3,910,064

CLASS 63
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15 3,910,066
15.6 3,910,067

CLASS 64
13 3,910,068

CLASS 66
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50R 3,910,070
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145S 3,910,073
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CLASS 69
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CLASS 70
30 3,910,078
58 3,910,079
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3,910,081
360 3,910,082
383 3,910,083

CLASS 71
105 3,910,783

CLASS 72
56 3,910,084
3,910,085
57 3,910,086
63 3,910,087
98 3,910,088
146 3,910,089
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256 3,910,091
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325 3,910,093
342 3,910,094
344 3,910,095
3,910,096
354 3,910,097
466 3,910,098
469 3,910,099
479 3,910,100

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40.5R 3,910,102
61.004 3,910,103
67.6 3,910,124
67.8S 3,910,104
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88.5R 3,910,106
118 3,910,107
143 3,910,108
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170A 3,910,111
210 3,910,112
212 3,910,113
228 3,910,114
231R 3,910,115
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516LM 3,910,122
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230.01 3,910,128
230.17B 3,910,129
242.9 3,910,130
331 3,910,131
384 3,910,132
479 3,910,133
513 3,910,134
532 3,910,135
611 3,910,136
796 3,910,137

CLASS 75
.5BA 3,910,785
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34 3,910,786
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53.2 3,910,139
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342 3,910,143
440.1 3,910,144
623 3,910,145
745 3,910,146
830 3,910,147
833 3,910,148

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1.03 3,910,150
267 3,910,151
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CLASS 85
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85 3,910,156

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CLASS 90
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36.01 3,910,168
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58.4 3,910,170
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91R 3,910,794
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443 3,910,201

CLASS 106
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38.3 3,910,798
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CLASS 108
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55 3,910,204
101 3,910,205
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CLASS 110
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CLASS 112
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219A 3,910,211

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18B 3,910,212
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CLASS 114
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66.5H 3,910,215
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206A 3,910,218
235R 3,910,219

CLASS 115
.5R 3,910,220

CLASS 116
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114R 3,910,224
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173 3,910,226

CLASS 118
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117 3,910,230
637 3,910,231
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CLASS 119
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3,910,239
32EA 3,910,240
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57R 3,910,242
117R 3,910,243
139BC 3,910,244
140MP 3,910,245
148E 3,910,246
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3,910,266
75 3,910,263
80A 3,910,267
132D 3,910,268
142 3,910,269
145.8 3,910,270
214.4 3,910,272
218P 3,910,273
227 3,910,274
234 3,910,275
303.1 3,910,276
3,910,277
3,910,278
303.15 3,910,279
327 3,910,280
335 3,910,281
339 3,910,282
350V 3,910,283
355 3,910,284

CLASS 130

24 3,910,285
27H 3,910,286

CLASS 131

8R 3,910,287
10.5 3,910,288

CLASS 132

7 3,910,289
39 3,910,290
53 3,910,291
3,910,292
89 3,910,293
91 3,910,294

CLASS 133

8R 3,910,295

CLASS 134

2 3,910,296
76 3,910,297

CLASS 136

145 3,910,799
170 3,910,800

CLASS 137

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13 3,910,299
38 3,910,301
43 3,910,302
78 3,910,300
112 3,910,303
209 3,910,304
224 3,910,305
498 3,910,306
515.3 3,910,307
553 3,910,308
580 3,910,309
595 3,910,310
596 3,910,311
614.03 3,910,312
625.23 3,910,313
625.62 3,910,314

CLASS 138

145 3,910,315
171 3,910,316

CLASS 139

102 3,910,317
262 3,910,318
308 3,910,319

CLASS 140

147 3,910,321

CLASS 141

2 3,910,323

CLASS 144

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3,910,325
34R 3,910,326
136R 3,910,327

CLASS 148

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32 3,910,802
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188 3,910,804

CLASS 149

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CLASS 150

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52R 3,910,329
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CLASS 151

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CLASS 152

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330L 3,910,334
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CLASS 156

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380 3,910,807
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433 3,910,809
510 3,910,810
521 3,910,811

CLASS 157

13 3,910,337

CLASS 159

3 3,910,812

CLASS 160

199 3,910,338
404 3,910,339

CLASS 162

5 3,910,813
102 3,910,814
199 3,910,815

CLASS 164

52 3,910,340
59 3,910,341
273R 3,910,342
340 3,910,343

CLASS 165

10 3,910,344
22 3,910,345
109 3,910,346
142 3,910,347

CLASS 166

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153 3,910,349
274 3,910,350
276 3,910,351
315 3,910,352

CLASS 172

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267 3,910,354
450 3,910,355
552 3,910,356

CLASS 173

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152 3,910,358
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36 3,911,200
42 3,911,199
72A 3,911,201
120SR 3,911,202
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CLASS 175

38 3,910,360
207 3,910,361

CLASS 176

19R 3,910,816
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CLASS 177

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6.6DC 3,911,208
6.6R 3,911,209
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6.8 3,911,212
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7.5R 3,911,214
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CLASS 181

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CLASS 182

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63 3,910,264
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CLASS 184

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CLASS 187

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52LC 3,910,384

CLASS 188

73.3 3,910,385
181R 3,910,386
322 3,910,387

CLASS 192

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58B 3,910,391
70.18 3,910,392

CLASS 194

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97R 3,910,394

CLASS 195

1.7 3,910,819
31F 3,910,821
31R 3,910,820
62 3,910,822
63 3,910,823
103.5R 3,910,824
116 3,910,825
142 3,910,826

CLASS 197

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5 3,910,396
6.1 3,910,397
73 3,910,398
161 3,910,399

CLASS 198

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130 3,910,403
3,910,404
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5R 3,911,233
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61.58B 3,911,236
83S 3,911,238
144B 3,911,239
153SC 3,911,240
157 3,911,241

CLASS 204

98 3,910,827
128 3,910,828
151 3,910,829
195C 3,910,830
273 3,910,833
278 3,910,831
284 3,910,832

CLASS 206

.81 3,910,408
303 3,910,409
363 3,910,410
422 3,910,411
459 3,910,412
466 3,910,413
515 3,910,414
520 3,910,415

CLASS 208

59 3,910,834

CLASS 209

74M 3,910,416
115 3,910,835
166 3,910,836
461 3,910,837

CLASS 210

7 3,910,838
60 3,910,839
91 3,910,840
231 3,910,841
252 3,910,842
531 3,910,843

CLASS 211

89 3,910,417

CLASS 213

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CLASS 214

1BB 3,910,420
3,910,422
3,910,423
1BC 3,910,419
1SW 3,910,421
6DK 3,910,424
3,910,425
8.5D 3,910,426
16R 3,910,427
3,910,429
17CC 3,910,428
21 3,910,430
35R 3,910,431
75H 3,910,432
75R 3,910,433
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390 3,910,435
506 3,910,436
509 3,910,437
518 3,910,438
520 3,910,439
770 3,910,440

CLASS 215

13R 3,910,441
218 3,910,442
252 3,910,443
295 3,910,444
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135 3,911,243
146 3,911,244
218 3,911,245
234 3,911,246
328 3,911,247
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442 3,911,250
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260 3,910,453
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CLASS 222

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41 3,910,458
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99 3,910,460
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135 3,910,462
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449 3,910,467

CLASS 223

52.1 3,910,468

CLASS 224

2C 3,910,469
5V 3,910,470
39 3,910,471
45R 3,910,472

CLASS 225

93 3,910,473
96.5 3,910,474

CLASS 226

6 3,910,475
158 3,910,476

CLASS 227

10 3,910,477

CLASS 228

2.5 3,910,478
20 3,910,479
45 3,910,480
49 3,910,481
160 3,909,915
216 3,909,917

CLASS 229

14R 3,910,482
23BT 3,910,483
34R 3,910,484
37R 3,910,485
51TC 3,910,486
3,910,487
55 3,910,488

CLASS 233

3 3,910,489

CLASS 235

61.11D 3,911,252
92FQ 3,911,253
92PD 3,911,254
150.25 3,911,255
151.11 3,911,258
151.12 3,911,259
151.3 3,911,256
3,911,257
151.34 3,911,260
153AP 3,911,261
156 3,911,262

CLASS 237

1A 3,910,490

CLASS 238

14 3,910,491
243 3,910,492
349 3,910,493

CLASS 239

13 3,910,494
58 3,910,495
118 3,910,496
127 3,910,497
137 3,910,498
228 3,910,499
310 3,910,500
417.5 3,910,501
531 3,910,502
533 3,910,503
543 3,910,504
597 3,910,320

CLASS 240

2AT 3,911,263
6.4R 3,911,264
52R 3,911,265
52.1 3,911,266
64 3,911,267

CLASS 241

18 3,910,505
29 3,910,506
73 3,910,507
101B 3,910,508
120 3,910,509
189R 3,910,510
261.3 3,910,511

CLASS 242

1 3,910,512
18G 3,910,513
18.1 3,910,514
35.6R 3,910,515
56A 3,910,518
56R 3,910,516
3,910,517
68 3,910,519
68.4 3,910,520
75.51 3,910,521
75.53 3,910,522
106 3,910,524
107.4 3,910,525
182 3,910,526
186 3,910,527
216 3,910,528

CLASS 243

6 3,910,523

CLASS 244

12B 3,910,529
42D 3,910,530
119 3,910,531
137P 3,910,532
161 3,910,533

CLASS 246

468 3,910,534

CLASS 248

16 3,910,535
68CB 3,910,537
68R 3,910,536
122 3,910,538
205A 3,910,539
206A 3,910,540
231 3,910,541
358AA 3,910,542
396 3,910,543
405 3,910,544

CLASS 249

7 3,910,545
40 3,910,546
104 3,910,547
141 3,910,548
205 3,910,549

CLASS 250

206 3,911,268
211J 3,911,269
227 3,911,270
252 3,911,271
281 3,911,272
322 3,911,273
328 3,911,274
339 3,911,275
343 3,911,276
345 3,911,277
366 3,911,278
385 3,911,279
395 3,911,280
442 3,911,282
483 3,911,283
492A 3,911,281

CLASS 251

144 3,910,550
3,910,551
148 3,910,552
205 3,910,553
208 3,910,554
306 3,910,555

CLASS 252

46.6 3,910,844
56R 3,910,845
62.1P 3,910,846
77 3,910,847
90 3,910,848
421 3,910,849
455R 3,910,850
3,910,851
512 3,910,852
522 3,910,853
523 3,910,854
527 3,910,855

CLASS 254

29R 3,910,556
150R 3,910,557
164 3,910,558
184 3,910,559

CLASS 256

24 3,910,560
65 3,910,561
3,910,562

CLASS 259

3 3,910,563
154 3,910,564

CLASS 260

33.6AQ 3,910,856
38 3,910,857
42.49 3,910,858
47UA 3,910,859
76 3,910,860
78L 3,910,861
79.3MU 3,910,862
79.5B 3,910,863
3,910,864
80.7 3,910,865
80.81 3,910,866
85.5S 3,910,867
89.5S 3,910,868
94.3 3,910,869
94.9B 3,910,870
112.5 3,910,871
3,910,872
124R 3,910,873
158 3,910,874
161 3,910,875
191 3,910,876
193 3,910,877
209R 3,910,878
3,910,879
210R 3,910,880
210.5 3,910,881
3,910,882
211.5R 3,910,883
3,910,884
3,910,885
239EP 3,910,886
239.3B 3,910,887
239.3D 3,910,889
239.3R 3,910,891
239.3T 3,910,890
239.5 3,910,888
240D 3,910,895
240H 3,910,894
3,910,897
240R 3,910,892
3,910,893
3,910,896
243C 3,910,899
3,910,900
3,910,902
243R 3,910,901
3,910,903
3,910,904

246B
247.2B
247.5R
248AS
248NS

251QB
251R
256.4N
256.4Q
256.5R
268BQ
268PH
279R
283SY
285

286R
287P
287R
288R

289C
289R
293.51
293.53
293.58
293.62
293.69
293.73
293.84
294.8E
294.8R
295A
295.5R
302D
302H
306.7T
307G
308R

309

309.6
309.7
311
326.13R
326.15
326.5FM
326.5B
327TH
330.5
335

340.5

340.7
340.9

343
345.2
345.7
347.2
396R
397.3
397.7R
403
404
410.6
413

429R
429.9
448A
448R
448.8R
453R
456A
463
465D
471A
471C
471R
475P
476R
478
479C
485G
502.5
505A
515A
524R

525
531R
533C
534L
534M
535R
543R
551P
553A
559A
559B
561N

246B 3,910,905
247.2B 3,910,898
247.5R 3,910,906
248AS 3,910,909
248NS 3,910,907
3,910,908
251QB 3,910,911
251R 3,910,910
256.4N 3,910,913
256.4Q 3,910,912
256.5R 3,910,914
268BQ 3,910,915
268PH 3,910,916
279R 3,910,917
283SY 3,910,918
285 3,910,919
3,910,920
286R 3,910,921
287P 3,910,923
287R 3,910,922
288R 3,910,924
3,910,925
289C 3,910,926
289R 3,910,927
293.51 3,910,928
293.53 3,910,929
293.58 3,910,930
293.62 3,910,931
293.69 3,910,932
293.73 3,910,933
293.84 3,910,934
294.8E 3,910,935
294.8R 3,910,936
295A 3,910,938
295.5R 3,910,937
302D 3,910,939
302H 3,910,940
306.7T 3,910,941
307G 3,910,942
308R 3,910,943
3,910,944
309 3,910,945
3,910,946
309.6 3,910,947
309.7 3,910,948
311 3,910,949
326.13R 3,910,952
326.15 3,910,953
326.5FM 3,910,951
326.5B 3,910,950
327TH 3,910,954
330.5 3,910,955
335 3,910,956
3,910,957
340.5 3,910,958
3,910,959
340.7 3,910,960
340.9 3,910,961
3,910,962
343 3,910,963
345.2 3,910,964
345.7 3,910,965
347.2 3,910,966
396R 3,910,967
397.3 3,910,968
397.7R 3,910,969
403 3,910,970
404 3,910,971
410.6 3,910,972
413 3,910,973
3,910,974
3,910,975
429R 3,910,976
429.9 3,910,977
448A 3,910,979
448R 3,910,978
448.8R 3,910,980
453R 3,910,981
456A 3,910,982
463 3,910,983
465D 3,910,984
471A 3,910,988
471C 3,910,989
471R 3,910,985
475P 3,910,986
476R 3,910,987
478 3,910,990
479C 3,910,991
485G 3,910,992
502.5 3,910,993
505A 3,910,994
515A 3,910,995
524R 3,910,996
3,910,997
525 3,910,998
531R 3,910,999
533C 3,911,000
534L 3,911,001
534M 3,911,002
535R 3,911,003
543R 3,911,004
551P 3,911,005
553A 3,911,006
559A 3,911,008
559B 3,911,007
561N 3,911,009

562H 3,911,010
562R 3,911,011
564RF 3,911,012
3,911,013
3,911,014
570.5S 3,911,015
570.8R 3,911,016
570.9 3,911,017
586C 3,911,018
597R 3,911,019
610B 3,911,020
611A 3,911,021
612D 3,911,022
3,911,023
614F 3,911,024
615R 3,911,025
617F 3,911,027
3,911,028
617R 3,911,026
618R 3,911,029
621B 3,911,030
622 3,911,031
636 3,911,032
649R 3,911,033
650R 3,911,034
653.1R 3,911,035
660 3,911,036
665G 3,911,037
668F 3,911,038
680E 3,911,039
681.5R 3,911,040
682 3,911,041
683.15D 3,911,042
683.45 3,911,043
683.48 3,911,044
826 3,911,045
840 3,911,046
859R 3,911,047
861 3,911,048
863 3,911,049
869 3,911,050
876B 3,911,051
878B 3,911,052
878R 3,911,053
880B 3,911,054
940 3,911,055
944 3,911,056
948 3,911,057
950 3,911,058
985 3,911,059

CLASS 261

27 3,911,060
34B 3,911,061
3,911,062
50R 3,911,063
87 3,911,064
91 3,911,065
94 3,911,066
113 3,911,067
121R 3,911,068

CLASS 264

23 3,911,069
44 3,911,070
89 3,911,071
117 3,911,072
171 3,911,073
318 3,911,074
329 3,911,075

CLASS 267

116 3,910,565
167 3,910,566

CLASS 271

42 3,910,567
221 3,910,568
244 3,910,569
245 3,910,570

CLASS 272

57R 3,910,577
58 3,910,571
68 3,910,572
79R 3,910,573

CLASS 273

1.5A 3,910,574
3,910,575
3C 3,910,576
96D 3,910,578
106.5B 3,910,579
119A 3,910,580
134CG 3,910,581
143R 3,910,582
176F 3,910,583

CLASS 274

14 3,910,584

CLASS 277

3,910,585
48 3,910,586
63 3,910,587
166 3,910,588

CLASS 279

19.1 3,910,590
61 3,910,589

CLASS 280

11.35K 3,910,591
11.35T 3,910,592
11.37E 3,910,593
124F 3,910,594
150AB 3,910,595
3,910,596
3,910,597
226R 3,910,598
234 3,910,599
280 3,910,600
289 3,910,602
293 3,910,603
406A 3,910,604
415R 3,910,601
3,910,605
425A 3,910,606

CLASS 283

1A 3,910,607

CLASS 285

3 3,910,608
24 3,910,609
337 3,910,610

CLASS 290

16 3,911,284
40 3,911,285
3,911,286
53 3,911,287

CLASS 292

33 3,910,612
34 3,910,613
38 3,910,611
219 3,910,614
263 3,910,615
283 3,910,616
341.16 3,910,617

CLASS 294

1CA 3,910,618
19R 3,910,619
64R 3,910,620
3,910,621
87.2 3,910,622

CLASS 296

1S 3,910,623
35R 3,910,624
37R 3,910,625
69 3,910,626
97H 3,910,627
137B 3,910,629
137F 3,910,628

CLASS 297

63 3,910,630
159 3,910,631
232 3,910,632
349 3,910,633
384 3,910,634

CLASS 298

35M 3,910,635

CLASS 299

5 3,910,636

CLASS 300

2 3,910,637

CLASS 301

63R 3,910,638

CLASS 303

3 3,910,639
6C 3,910,640
7 3,910,641
21BE 3,910,644
21A 3,910,646
3,910,647
21F 3,910,643
3,910,645
3,910,648
84A 3,910,642

CLASS 305

10 3,910,649

CLASS 307

147 3,911,288
205 3,911,289
221C 3,911,290
229 3,911,291
235R 3,911,293
235 3,911,292
251 3,911,294
261 3,911,295
297 3,911,296
311 3,911,297

CLASS 308

9 3,910,650
26 3,910,651
3,910,652
36.1 3,910,653
72 3,910,654
138 3,910,655
194 3,910,656
216 3,910,657

CLASS 310

8.1 3,911,298
64 3,911,299
86 3,911,300
111 3,911,301
168 3,911,302
236 3,911,303
241 3,911,305
242 3,911,304

CLASS 312

214 3,910,658
226 3,910,659
312 3,910,660
351 3,910,661

CLASS 313

58 3,911,306
143 3,911,307
184 3,911,308
230 3,911,311
346R 3,911,309
3,911,312
3,911,313
361 3,911,314
391 3,911,315
473 3,911,310
562 3,911,316

CLASS 315

30 3,911,317
39 3,911,318
176 3,911,319
240 3,911,320
364 3,911,321

CLASS 316

30 3,910,662

CLASS 317

16 3,911,322
18R 3,911,323
33VR 3,911,324
40R 3,911,325
98 3,911,326
100 3,911,327
118 3,911,328
157.62 3,911,332
247 3,911,334
262A 3,911,335

CLASS 318

48 3,911,336
130 3,911,337
138 3,911,338
171 3,911,339
230 3,911,340
314 Re.28,567
341 3,911,341
373 3,911,342
392 3,911,343
480 3,911,344
561 3,911,345
567 3,911,346
632 3,911,347

CLASS 320

1 3,911,348
20 3,911,349
22 3,911,350
39 3,911,351

CLASS 321

14 3,911,352

CLASS 323

1 3,911,353
4 3,911,354

CLASS 324

.5AH 3,911,355
51 3,911,357
52 3,911,358
106 3,911,359
133 3,911,360
147 3,911,356
158P 3,911,361
182 3,911,362

CLASS 325

38B 3,911,363
301 3,911,364
346 3,911,365
347 3,911,366
392 3,911,367

CLASS 328

14 3,911,329
37 3,911,330
75 3,911,331
155 3,911,368
163 3,911,369

CLASS 330

21 3,911,370
28 3,911,371
53 3,911,372

CLASS 331

65 3,911,373
3,911,374
94.5H 3,911,376
94.5P 3,911,375
111 3,911,377
116R 3,911,378

CLASS 333

29 3,911,379
31A 3,911,380
72 3,911,381
84M 3,911,382

CLASS 335

106 3,911,383

CLASS 336

84 3,911,384

CLASS 337

202 3,911,385

CLASS 338

34 3,911,386
47 3,911,387

CLASS 339

14 3,910,663
17CF 3,910,664
17C 3,910,665
22R 3,910,667
65 3,910,668
75R 3,910,669
97P 3,910,672
97R 3,910,670
3,910,671
177R 3,910,673
180 3,910,674
276T 3,910,666

CLASS 340

17 3,911,388
38L 3,911,389
38R 3,911,390
52B 3,911,392
52H 3,911,391
62 3,911,393
71 3,911,394
146.1AB 3,911,395
147MD 3,911,397
147SC 3,911,396
149A 3,911,398
164R 3,911,399
172.5 3,910,322
3,911,400
3,911,401
3,911,402
3,911,403
3,911,404
3,911,405
3,911,406
3,911,407
3,911,408
3,911,409
173LM 3,911,410
174TF 3,911,411
227.1 3,911,412
237R 3,911,413
274 3,911,414
310A 3,911,415
311 3,911,416
324AD 3,911,418
3,911,419
3,911,420
324M 3,911,417
3,911,421
3,911,422
3,911,423
324R 3,911,424
326 3,911,425
336 3,911,426
347DA 3,911,427
347DD 3,911,428
365L 3,911,429
378A 3,911,431
378R 3,911,430

CLASS 343

5R 3,911,432
6ND 3,911,433
6.5R 3,911,434
100ME 3,911,435
108M 3,911,437
108R 3,911,436
113R 3,911,438
118 3,911,439
709 3,911,441
754 3,911,442
755 3,911,440
767 3,911,443

CLASS 346

1 3,911,444
3,911,445
33R 3,911,446
74SB 3,911,447
140 3,911,448

CLASS 350

7 3,910,675
68 3,910,676
96C 3,910,677
3,910,678
150 3,910,679
160LC 3,910,680
3,910,681
3,910,682
162SF 3,910,683
199 3,910,684
226 3,910,685
252 3,910,686
267 3,910,687
278 3,910,688
302 3,910,689

CLASS 351

31 3,910,690
169 3,910,691

CLASS 352

130 3,910,692
244 3,910,693

CLASS 353

15 3,910,694
101 3,910,695
116 3,910,696

CLASS 354

50 3,911,449
77 3,911,450
79 3,911,451
83 3,911,452
100 3,911,453
154 3,911,454
204 3,911,455
209 3,911,456
225 3,911,457
230 3,911,458
273 3,911,459
328 3,911,460

CLASS 355

15 Re.28,566
17 3,910,697
54 3,910,698
66 3,910,699

CLASS 356

21 3,910,700
39 3,910,701
72 3,910,702
169 3,910,703
249 3,910,704

CLASS 357

5 3,911,333
13 3,911,461
17 3,911,462
21 3,911,463
23 3,911,464
3,911,465
3,911,466
24 3,911,467
27 3,911,468
30 3,911,469
36 3,911,470
50 3,911,471
51 3,911,472
52 3,911,473
71 3,911,474
72 3,911,475

CLASS 358

4 3,911,476
3,911,477
10 3,911,478
44 3,911,479
75 3,911,480

CLASS 360

4 3,911,481
15 3,911,482
33 3,911,483
35 3,911,484
45 3,911,485
53 3,911,487
64 3,911,486
71 3,911,488
72 3,911,489
84 3,911,490
85 3,911,491
3,911,492
90 3,911,493
92 3,911,494
96 3,911,495

CLASS 401

30 3,910,705
134 3,910,706
135 3,910,707

CLASS 402

80R 3,910,708

CLASS 403

8 3,910,709

CLASS 404

28 3,910,710
89 3,910,711
124 3,910,712

CLASS 408

1 3,910,713

CLASS 415

53R 3,910,714
182 3,910,715
217 3,910,716
219C 3,910,717

CLASS 416

132 3,910,718
134 3,910,719
145 3,910,720
160 3,910,721

CLASS 417

34 3,910,722
206 3,910,724
214 3,910,723

CLASSIFICATION OF PATENTS

234	3,910,725
240	3,910,726
387	3,910,727
390	3,910,728
417	3,910,729
554	3,910,730
CLASS 418	
9	3,910,731
60	3,910,732
61B	3,910,733
178	3,910,734
CLASS 423	
53	3,911,076
58	3,911,077
87	3,911,078
167	3,911,079
210	3,911,080
210.5	3,911,081
226	3,911,082
235	3,911,083
242	3,911,084
277	3,911,085
306	3,911,086
321	3,911,087
329	3,911,088
376	3,911,089
419	3,911,090
510	3,911,091
520	3,911,092
574	3,911,093
592	3,911,094
607	3,911,095
CLASS 424	
1	3,911,096
12	3,911,097
22	3,911,098
	3,911,099
28	3,911,100
40	3,911,101
49	3,911,102
52	3,911,104
64	3,911,105
70	3,911,106
78	3,911,107
86	3,911,108
92	3,911,109
93	3,911,110
118	3,911,111
	3,911,112
123	3,911,113
128	3,911,114
180	3,911,115
	3,911,116
	3,911,117
200	3,911,118
209	3,911,119
211	3,911,120
219	3,911,121
225	3,911,122
226	3,911,123
234	3,911,124
244	3,911,125
246	3,911,126
250	3,911,127
253	3,911,128
256	3,911,129
258	3,911,130
263	3,911,131
272	3,911,132
273	3,911,133
274	3,911,134
	3,911,135
298	3,911,136
319	3,911,137
352	3,911,138
CLASS 425	
46	3,910,735
137	3,910,736
140	3,910,737
162	3,910,738
209	3,910,739
242R	3,910,740
249	3,910,743
302B	3,910,741
	3,910,742
384	3,910,744
387B	3,910,746
387R	3,910,745
397	3,910,747
444	3,910,748
CLASS 426	
16	3,911,139
36	3,911,140
51	3,911,103
60	3,911,141
265	3,911,146
268	3,911,148
	3,911,149
	3,911,150
	3,911,151
	3,911,152
	3,911,153
282	3,911,154
296	3,911,155
318	3,911,147
393	3,911,156
459	3,911,157
534	3,911,158
559	3,911,142
580	3,911,159
583	3,911,143
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CLASS 427	
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CLASS 428	
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425	3,911,196
CLASS 431	
116	3,910,749
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290	3,910,753
CLASS 432	
11	3,910,754
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118	3,910,756
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D06—	8	237,023
	31	237,024
	36	237,025
	42	237,026
	47	237,027
	68	237,028
	113	237,029
	114	237,030
D07—	6	237,031
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	105	237,034
	166	237,035
	173	237,036
D08—	47	237,037
	57	237,038
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		237,043
		237,044
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	229	237,046
D09—	63	237,047
	84	237,048
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	190	237,053
	216	237,054
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D10—	2	237,057
	15	237,058
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	123	237,063
D12—	105	237,064
	146	237,065
	151	237,066
	211	237,067
D18—	2R	237,068
D19—	62	237,069
	72	237,070
D22—	5	237,071
	13	237,072
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		237,074
		237,075
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	22	237,081
D23—	32	237,082
	97	237,083
		237,084
	167	237,085
D24—	1D	237,086
D26—	5C	237,087
		237,088
	14A	237,091
	G	237,089
	H	237,090
D30—	13	237,092
	43	237,093
D34—	SQQ	237,094
	15A	237,095
D39—	1R	237,096
		237,097
		237,098
D45—	10C	237,099
		237,100
D52—	2A	237,101
	3R	237,102
D54—	1	237,103
		237,104
D55—	C	237,105
	D	237,106
D56—	4R	237,107
D57—	1C	237,108
D64—	11	237,109
	12B	237,110
D70—	2A	237,111
	R	237,112
D83—	1A	237,114
	F	237,113
	H	237,115
	12R	237,116
D86—	10F	237,117
		237,118
	12	237,119
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DEFENSIVE PUBLICATIONS APPLICATIONS

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62—	58	T939,007
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176—	61	T939,002
252—	301.1W	T939,005
260~~2~~.5AC		T939,016
	32.6N	T939,013
	562H	T939,003
264—	36	T939,014
320—	64	T939,015
340—	172.5	T939,006
444—	1	T939,004
		T939,009
		T939,010
		T939,011

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Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
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Canal Zone	7	Minnesota	27	Tennessee	47
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,909,871	3,910,175	3,910,716	3,911,346	3,910,700	3,910,236
3,910,191	3,910,176	3,910,738	3,911,360	3,910,719	3,910,474
3,910,307	3,910,192	3,910,747	3,911,363	3,910,772	3,911,097
3,910,332	3,910,207	3,910,753	3,911,368	3,910,842	3,911,174
3,911,086	3,910,218	3,910,773	3,911,381	3,910,857	15 : 3,909,960
2 : 3,909,951	3,910,242	3,910,783	3,911,394	3,910,879	16 : 3,910,179
3 : 3,909,928	3,910,251	3,910,803	3,911,413	3,911,064	3,910,346
3,909,932	3,910,257	3,910,804	3,911,419	3,911,098	3,910,433
4 : 3,909,930	3,910,258	3,910,808	3,911,420	3,911,144	3,910,985
3,909,979	3,910,259	3,910,819	3,911,425	3,911,164	17 : 3,909,880
3,910,414	3,910,261	3,910,837	3,911,430	3,911,181	3,909,882
3,910,604	3,910,262	3,910,845	3,911,432	3,911,259	3,909,883
3,911,114	3,910,269	3,910,885	3,911,435	3,911,297	3,909,884
3,911,216	3,910,271	3,910,907	3,911,439	3,911,375	3,909,933
3,911,296	3,910,292	3,910,935	3,911,442	3,911,465	3,909,976
3,911,426	3,910,294	3,910,957	3,911,446	10 : 3,910,187	3,909,977
3,911,461	3,910,296	3,911,003	3,911,460	3,910,847	3,909,980
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3,911,472	3,910,327	3,911,063	3,911,480	3,910,860	3,909,984
5 : 3,909,925	3,910,331	3,911,068	3,911,486	3,910,876	3,909,996
3,910,107	3,910,374	3,911,084	3,911,488	3,910,877	3,910,009
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3,910,528	3,910,439	3,911,096	8 : 3,909,888	3,910,929	3,910,083
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3,909,854	3,910,457	3,911,107	3,910,299	3,910,977	3,910,093
3,909,859	3,910,466	3,911,118	3,910,478	3,910,990	3,910,128
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3,909,911	3,910,473	3,911,127	3,910,605	3,911,185	3,910,156
3,909,924	3,910,484	3,911,143	3,910,831	11 : 3,909,855	3,910,161
3,909,939	3,910,500	3,911,148	3,911,049	3,910,253	3,910,171
3,909,969	3,910,501	3,911,149	3,911,241	3,910,822	3,910,184
3,909,970	3,910,541	3,911,151	3,911,279	3,911,336	3,910,201
3,909,978	3,910,542	3,911,152	3,911,303	3,911,389	3,910,206
3,909,987	3,910,557	3,911,153	3,911,414	12 : 3,909,847	3,910,213
3,909,992	3,910,581	3,911,163	9 : 3,909,910	3,909,935	3,910,255
3,909,994	3,910,583	3,911,167	3,909,941	3,910,102	3,910,274
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DESIGN PATENTS

4 : 237,061
6 : 237,029
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237,113
237,122
8 : 237,095
9 : 237,057
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20 : 237,039
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237,078
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237,118
51 : 237,041
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237,082
55 : 237,047
56 : 237,040

PLANT PATENTS

6 : 03,792

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

5 : T939,009
9 : T939,005
17 : T939,007

36 : T939,003
T939,004
T939,006

T939,010
T939,011

47 : T939,008
T939,013

T939,014
T939,016

48 : T939,012
53 : T939,002

U. S. GOVERNMENT PRINTING OFFICE : O - 1975

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